Energy Resources Aotearoa
POWERING A BETTER NEW ZEALAND TOGETHER

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11 August 2023

Ministry for the Environment
By email: etsconsultation@mfe.govt.nz

Submission on a redesigned NZ ETS Permanent Forest Category

Introduction

1. Energy Resources Aotearoa is New Zealand's peak energy advocacy organisation. Our purpose is to enable constructive collaboration across the energy sector through and beyond New Zealand's transition to net zero carbon emissions in 2050.

2. This document constitutes our submission on the Ministry for the Environment's (**the Ministry**) consultation on the redesign of the Emissions Trading Scheme (**ETS**) permanent forest category (the **consultation document**). It should be read in tandem with our parallel submission on the ETS Review, which offers more detail on our high-level views and guiding policy principles, much of which apply here.

3. Following the key points section, this submission makes some overarching points about the policy intent of the consultation, and then offers our positions on the options to redesign the permanent forest category.

Overarching points

The ETS should be focused on its core policy objective – reducing emissions at least cost – with externalities managed by other policy tools

4. We have consistently argued that the design of the ETS should focus on establishing a market price for carbon; based on 1:1 fungibility with emissions; under a falling quantity cap; and consistent with a trajectory to net zero emissions by 2050. The externalities of emissions reductions and removals, such as increased afforestation and its local environmental and social impacts, should be managed through separate dedicated policy tools, such as land use planning and environmental regulations, rather than the ETS which is not set up for this purpose.

5. To this end, the multiple objectives of the consultation document are likely to confuse things, with the ETS expected to achieve all manner of outcomes. For example, we suggest that the additional (biodiversity, etc) benefits of indigenous

forestry could be recognised through non-ETS measures such as biodiversity credits.

We are sceptical that the Government's projections of afforestation will eventuate

6. We see multiple reasons why ETS-driven afforestation might not occur at the scale or speed anticipated by the Government's projections:

    - recent extreme carbon price volatility in the secondary market, driven by:

        a) market responses to the Commission's 2022 advice on ETS price and unit settings;

        b) the Government's subsequent decision in December 2022;

        c) the successful court appeal of this decision; and

        d) the uncertainty introduced by the ETS review and permanent forestry category consultation;

    - the end of the stock change option for forestry (this had driven an increase in applications ahead of the phase-out deadline, which has now passed);

    - an MPI proposal to charge an annual fee to forest owners to cover the costs of administering the ETS;

    - softening of investment confidence in marginal land in response to recent storm events (e.g., Cyclone Gabrielle) which significantly affected existing and planned plantation and carbon forests; and

    - Overseas Investment Act changes which replaced the previous special forestry test with a benefit to New Zealand test (and recent public announcements by the Opposition that it will ban overseas investment in carbon forestry registered in the ETS).

7. We also expect that other ancillary measures to address the environmental and social effects of afforestation (the Government's 'right tree, right place, right purpose' strategy) will soften the forestry sector's response to a rising ETS price.

8. Given the primary driver of proposed changes to ETS forestry settings is a concern about the prospect of overabundance of (particularly exotic) forestry, we believe the countervailing factors above should be considered and incorporated into expectations about future planting rates.

Commentary on options to redesign the permanent forest category

Design decision 1: Which forests should be allowed into the permanent forest category?

9. As noted in our 2022 submission, and consistent with our argument in paragraph 4 above, we are opposed to an outright ban on the inclusion of exotic species in the permanent forest category.[1]

10. The consultation document notes there is some uncertainty about the long-term environmental and ecological risks that permanent exotic forests pose, due to a lack of long-term data in New Zealand. To mitigate this, the Government has proposed a cautious approach – which we understand is to exclude exotic species from the permanent forest category, with possible exceptions canvassed in the consultation document.

11. A better approach would be to establish flexible and adaptive permanent forest management requirements, and to create viable pathways for long-term transition to indigenous forestry. Such an approach would also avoid further significant changes to investment settings and property rights (given exotics are currently allowed in the permanent category).

12. Given the Government appears to have taken a decision to exclude exotic species from the permanent category, and is now considering exceptions, we offer the following points:

    - we support Option 1.2a – inclusion of long-lived exotic species – on the basis it is less restrictive than outright exclusion of exotics, and that some exotic species are well-suited to permanent cover;

    - we do not support Option 1.2b – allowing exotic species on Māori-owned land only – because while we acknowledge large amounts of Māori land may be underdeveloped and would remain so without options to access the permanent category, this situation likely also applies to some non-Māori land. We do not support differential treatment based on the status of the landowner;

    - we support Option 1.2c – inclusion of exotic species in small woodlots – on the basis it is less restrictive than outright exclusion of exotics. It would create more options for afforestation in small lots where no other economically viable options are available. Further development of this option should assess its benefits and costs and test the proposed (arbitrary) 50ha cut-off.

1 Our 2022 submission is available here: https://www.energyresources.org.nz/dmsdocument/213

Design decision 2: How should transitional forests be managed to ensure they transition and reduce the financial risks to participants?

13. We support in principle further development of Option 2.2 – a new mandatory specific carbon accounting method for transition forests in the permanent forest category – on the basis this would smooth the financial liability for forest owners and won't change the overall number of units that participants end up with in the long run. It could also offer an 'offramp', wherein transition forests could be moved to the standard (non-permanent) forest category under averaging accounting if transition is unsuccessful. However, the specific accounting values should be carefully considered to ensure they strike a balance between incentivising long-term transition to indigenous species, while also providing sufficient financial rewards for exotic species upfront.

14. The standard carbon accounting method should remain available to permanent exotic forests (whichever exception they are planted under).

Design decision 3: How should permanent forests be managed?

15. We support further development of Options 3.2 and 3.3 (new forest management requirements for the permanent forest category, and for transition forests). The actual implementation of any new requirements should be targeted at specified additional risks and should be proportionate to that risk, to ensure any additional costs for participants and regulators are justified. It might be the case that these could be included in the NES-PF; or might involve the introduction of a new dedicated NES for permanent forestry. We have no strong view on this at this point.

16. Management requirements and enforcement should embrace outcomes-focused flexibility, particularly for transition forestry, given it is a novel model and will likely be iterated over time.

Conclusion

17. The ETS market has been buffeted for several years now by a rolling maul of policy changes and consultations – including both 'routine' decisions around ETS unit and price control settings, as well as commentary on more fundamental policy and design questions (such as this consultation).

18. We appreciate that the ETS is not a perfect mechanism, and like New Zealand's broader climate policy settings, requires difficult trade-offs to be made about the pace and scale of the low-emissions transition.

19. However, our overarching preference is that the ETS is as much as possible left to do what it is designed to: incentivise least-cost net emissions reductions, within a fixed quantity cap that is declining over time consistent with a trajectory to net zero by 2050. We acknowledge the land use decisions driven by the carbon price –

such as afforestation – will have wider impacts on their local environment and communities. But it remains our view that other mechanisms, such as land use planning and environmental regulations, are better suited to address these.

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Submission on the Review of the New Zealand Emissions Trading Scheme

Introduction

1. Energy Resources Aotearoa is New Zealand's peak energy advocacy organisation. Our purpose is to enable constructive collaboration across the energy sector through and beyond New Zealand's transition to net zero carbon emissions in 2050. Our members include upstream energy producers (OMV, Todd, Beach, Matahio); downstream fuel suppliers (Mobil New Zealand); electricity generators and distribution (Genesis Energy and Powerco); and large energy users (Methanex, Oji Fibre Solutions).

2. This document constitutes our submission on the Ministry for the Environment's (**the Ministry**) consultation on the review of the New Zealand Emissions Trading Scheme (**ETS**). Note we have also separately submitted on the redesign of the permanent forest category.

3. Beyond the key points below, this submission proceeds as follows:

    - Part 1: The policy case for the review and the debate between a net-focused transition and one prioritising gross reductions;
    - Part 2: Other important issues for consideration, including retrospectivity, carbon capture, and industrial allocation among others; and
    - An appendix containing brief discussion on the high-level options floated in the discussion document.

Key points

- We believe the ETS review is premature. The Government first needs to decide whether it will depart from a net emissions strategy, and if so, to set indicative levels of gross emissions and carbon dioxide removals from forestry out to 2050 to guide policy development. We expect this will be done in the Second Emissions Reduction Plan.

- We continue to support a net emissions strategy in pursuit of a least cost transition. The Government's projections indicate the ETS can deliver net zero by 2050, albeit with a significant portion of this being met through forestry removals.

- In absence of clarity about the preferred balance of emissions and removals (and relatedly, indicatively required ETS volumes and prices), and with the options not being fully specified, it is difficult to assess options to redesign the ETS.

- Externalities that are unrelated to the core function of the ETS should be addressed through other mechanisms. The Government's non-ETS efforts to manage forestry activities ('right tree, right place, right purpose') are among various reasons to expect afforestation will not be as large-scale as projected.

- The ETS review introduced significant additional uncertainty to a market already buffeted by a rolling maul of policy proposals and changes. The worst of the market reaction could have been avoided by ruling out retrospective changes to existing property rights, including already-registered forestry and the 1:1 fungibility of existing NZUs with emissions. This commitment should be made as a priority.

- Industrial allocation is a critical lever to mitigate emissions leakage risk, and the gradual decline in allocation has been well signalled out to 2050. We strongly caution against further reductions in allocation to achieve more aggressive emissions reductions, as some of the review's options envisage.

- Carbon capture, utilisation, and storage could play a critical role in the low-emissions transition, so the ETS review should consider any necessary changes to ensure it is enabled and recognised appropriately.

Part 1: The overarching policy debate

The policy case for the ETS review is based on two core arguments

4. The policy case for limiting the contribution of forestry removals to our low-emissions transition, in favour of pursuing more gross emissions reductions, rests on two key arguments:

    - **Argument 1 (national net vs. gross emissions):** the ETS will not deliver an optimal low-emissions transition, on the basis it will not achieve a desirable balance of gross reductions and removals which is consistent with long-term net zero; and

    - **Argument 2 (localised externalities):** ETS-driven afforestation has externalities, both negative (environmental/social impacts from large-scale exotic/monoculture afforestation), and positive (biodiversity benefits of native afforestation), which are not recognised or managed within the ETS.

5. We deal with each of these arguments in turn below.

Argument 1: Achieving an optimal balance of gross reductions and removals

Our general position

6. Our view is that New Zealand should focus on reducing its net emissions (gross emissions minus removals) consistent with reaching its legislated domestic target of net zero emissions (excluding biogenic methane) by 2050. Accumulation of greenhouse gases in the atmosphere is a function of net emissions.

7. Focusing on net emissions, rather than a particular balance of gross emissions and removals, helps to keep as many technology, fuel, and reduction/removal options as possible on the table. The ETS as it is currently set up recognises that 'a tonne is a tonne', and prices emissions and removals on this common basis. Options to reduce or remove emissions can then be compared and prioritised on their marginal costs of abatement at the individual, household, firm, and economy level.

8. The ETS helps us to discover an efficient least-cost trajectory toward net zero by 2050 by co-ordinating the preferences and decisions of millions of actors every day.[1] By definition, any policy measures that constrain optionality (either by closing options or incentivising options disproportionately to their emissions value) will increase the overall cost of that transition.

9. To the extent a least-cost trajectory involves the use of forestry (or other) removals, this reflects that they are an affordable way to bridge the gap toward net zero while the costs of new low-emissions technologies to reduce gross emissions fall. Any externalities – positive or negative – can be dealt with in separate non-ETS measures (see paragraph 28 onward), but the costs and benefits of these measures should be dealt with transparently.

10. For more detail, we have dealt previously with assertions that a least-cost pathway is not optimal – see https://www.energyresources.org.nz/dmsdocument/178.

The rationale for change laid out in the ETS review

11. The primary rationale for the ETS review – reflecting advice from the Climate Change Commission (**the Commission**) – is that under current settings, New Zealand will over-rely on forestry removals, with a correspondingly insufficient reduction in its gross emissions, because for many emitters it will be cheaper to pay for their emissions than invest in reducing them.

12. Government modelling shows this in turn could lead to an overabundance of forestry that could see the price of carbon decline within the next decade, further disincentivising emissions reductions. The Commission has further argued that:

1 'Least cost' simply means the least cost to community welfare compared to other pathways.

- projected rates of afforestation would leave significant residual gross emissions beyond 2050 and return New Zealand to net positive emissions by 2065 if planting rates aren't sustained;

- the sequestration of significant amounts of carbon above ground (in forests) creates an ongoing obligation risk, i.e., where forests are affected by fires storms, and other hazards; and

- the ETS would also not provide an incentive for forestry removals above and beyond what is demanded within the ETS, which are required to achieve net zero across non-ETS long-lived gases such as nitrous oxide.

Our response

13. We appreciate that neither the Commission nor Government is arguing that New Zealand should abandon forestry removals entirely. On the contrary, both reinforce that removals will continue to play a critical role in the transition and should be incentivised in some form. But this leaves the market grappling with significant uncertainty, reflected in ETS price volatility: if the Government wishes to focus more on gross reductions, while continuing to incentivise removals, what will its preferred balance between the two look like, and how will this affect existing and prospective investments?

14. We think this question should have been resolved before the ETS review was initiated and it is not resolved by the ETS review consultation document itself. This is the primary reason we have struggled to engage in detail with the high-level options laid out in the discussion document. Without knowing what balance of gross emissions and removals is sought, nor a clear sense of the potential ETS volume and price implications, it is challenging to assess the alternatives against each other.

15. New Zealand's strategic direction with respect to its low-emissions transition should be set first, ideally with meaningful stakeholder engagement and enduring cross-party political support. This strategic direction could confirm a focus on gross emissions reductions (if this is the preferred approach) and set indicative targets for gross emissions and removals over time.[2] We expect this will occur in the development of the Government's second Emissions Reduction Plan.

16. From this we could then infer the required ETS volumes, prices, and levels of afforestation intended by policy settings. Only then should the policy mechanism(s), e.g., the ETS and others, have been recalibrated to align with that long-term direction.

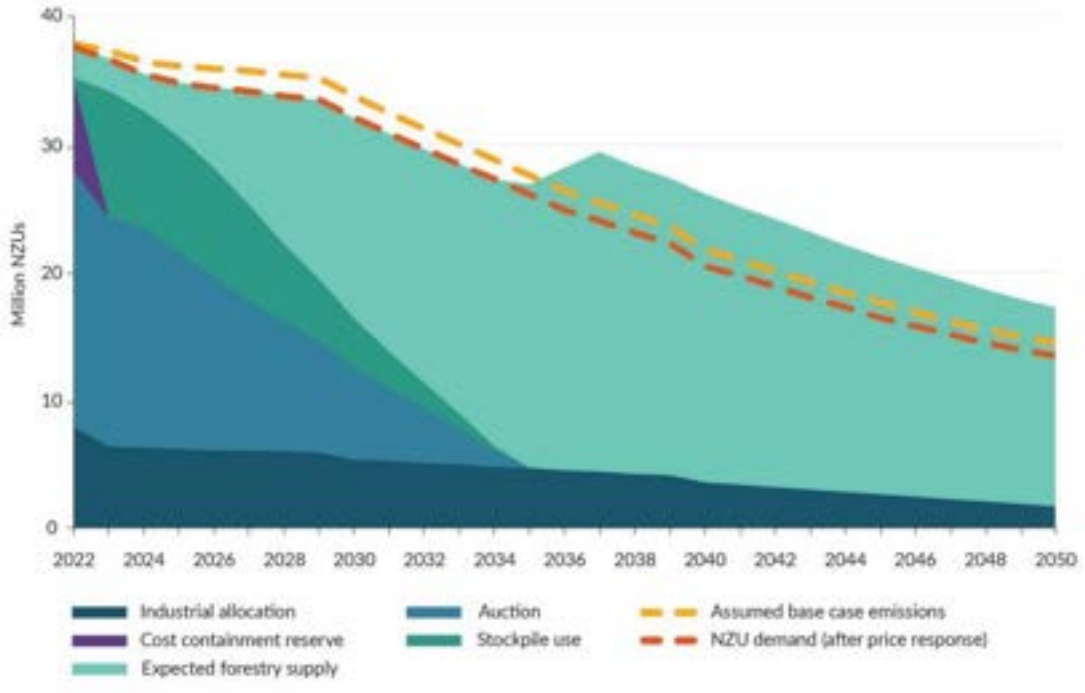
2 Given our position laid out above, we unsurprisingly would oppose a shift away from a net focus, but the important point is that the debate is resolved at the strategic level, not through continued tactical changes to the ETS.

17. The Commission points toward this kind of strategic approach in its *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan*. The draft advice recommended that the Government "communicate indicative levels of gross emissions and carbon dioxide removals from forestry out to 2050 and beyond to guide policy development" alongside committing to gross emission limits in the next emissions budgets.

18. If these indicative long-term targets for emissions and removals were available, and ETS review options then more specified, submitters would be able to engage by assessing the extent to which they might deliver the desired levels of emissions and removals. It would also enable a more fruitful debate about the relative costs and benefits of departing from our current net emissions pathway toward the Commission's and/or Government's preferred pathway.

19. The consultation document, and subsequent release of modelling data, go some way to highlighting the trade-offs that need to be made. The Government's model (Figure 5 below) from the consultation document illustrates the Government's current projections of ETS supply and demand under existing settings, and note this scenario sees the ETS price steadily declining to below $30 per tonne by 2050.[3] This projection achieves net zero, with 13 million tonnes of residual gross emissions in 2050 offset by equivalent volumes of forestry removals.

Figure 5: Total supply and demand with falling price



3 See pages 27 and 28: Review-of-the-New-Zealand-Emissions-Trading-Scheme-Discussion-Document.pdf (environment.govt.nz). A subsequent update based on new unit and price control settings indicates the expected 2050 ETS price is ~$60, but the model may need to be calibrated as this leads to significant oversupply of forestry offsets.

20. Figure 5 sees ETS prices fall below $30 by 2050, but per our arguments about a least cost transition above, this is not necessarily a problem as such if New Zealand has achieved its net zero target, and if any externalities of forestry are adequately managed. The outcome sought by the ETS is net zero emissions, not necessarily high prices. Indeed, if New Zealand has sufficient domestic resources to deliver a net emissions transition without high carbon prices, thereby retaining its international economic competitiveness, the ETS is designed to discover this.

21. The summary of modelling report released later in the consultation period helps to further illuminate what alternatives could look like.[4] These are summarised in the table below – though there are countless other possible combinations of gross emissions and removals compatible with net zero.

	ETS indicative price path		**Gross ETS emissions**		**Net zero 2050**
	2022 / 2023	**2050**	**2050 (Mt)**	**Reduction vs. 2022**	
Government model (Figure 5 above)[5]	$80	$26*	13.5	-64%	✓
Lower price variant[6]	$50	$111	11.7	-70%	✓
Commission's demo path	$70	$260	9.2	-76%	✓
Higher price variant	$300	$666	7.8	-79%	✓

**Note a subsequent update to this model based on new unit and price control settings announced in July 2023 shows the price drop to 2050 is less dramatic, reaching ~$60, but the model may need to be calibrated as this assumes significant oversupply of forestry offsets.*

22. Those scenarios that achieve deeper gross emissions reductions tend to feature higher ETS price paths. They also require correspondingly smaller contributions from forestry offsets (and presumably involve policy design, like ETS reform or other, to achieve this more limited contribution). This follows logically – as the price of carbon rises (presumably due to limiting supply of removals), this will improve the business case for more emissions reductions such as energy efficiency and fuel switching.

4 Review-of-the-New-Zealand-Emissions-Trading-Scheme-Summary-of-Modelling.pdf (environment.govt.nz)

5 Figure 5 from the consultation document.

6 Lower price variant, Commission demo path, and higher price variant scenarios are from the Summary of Modelling document available here: Review-of-the-New-Zealand-Emissions-Trading-Scheme-Summary-of-Modelling.pdf (environment.govt.nz)

23. What strikes us is how stubborn a significant portion of gross emissions are in 2050, even at very high carbon prices.[7] We draw two conclusions:

    - this reinforces the importance of both industrial allocation and continued availability of forestry offsets, to ensure significantly high carbon prices do not simply drive 'decarbonisation by deindustrialisation'; and

    - this raises an important question, at the heart of the 'net focus versus gross focus' debate, about New Zealand's appetite for much higher carbon prices in exchange for additional gross emissions reductions, and the impact this could have on hard-to-abate (particularly industrial) sectors of the economy.

24. The Commission has argued that more removals-reliant scenarios might return New Zealand to net positive emissions beyond 2065 if planting rates are not maintained. By way of brief response, we note it is highly likely that as the rest of the world progresses toward net zero, technological cost curves will continue to fall, and innovation will unlock additional cost-effective opportunities for emissions reductions. This process of bridging the technology cost gap with affordable removals is a core reason why we advocate for a least cost, net emissions approach.

25. In any case, we see some reasons why ETS-driven afforestation might not occur at the scale or speed anticipated by the Government's projections:

    - recent carbon price volatility in the secondary market, driven by a) market responses to the Commission's 2022 advice on ETS price and unit settings; b) the Government's subsequent decision in December 2022; c) the successful court appeal of this decision; and d) the ETS review and permanent forestry category consultation;

    - the end of the stock change option for forestry (this had driven an increase in applications ahead of the phase-out deadline, which has now passed);

    - an MPI proposal to charge an annual fee to forest owners to cover the costs of administering the ETS;

    - softening of investment confidence in marginal land in response to recent storm events (e.g., Cyclone Gabrielle) which significantly affected existing and planned plantation and carbon forests; and

    - Overseas Investment Act changes which replaced the previous special forestry test with a benefit to New Zealand test (and recent public announcements by the Opposition that it will ban overseas investment in carbon forestry registered in the ETS).

7 Note some of this might be explained by limitations of the model – we have in the past expressed some scepticism about the usefulness of marginal abatement cost curve approaches at the aggregate economy level, which are likely to be much more relevant at the firm level.

26. It is unclear to what extent the effect of these measures is reflected in the Government's modelling assumptions.

27. We also expect that other ancillary measures to address the environmental and social effects of afforestation will soften its response to a rising ETS price (see paragraph 28 onward).

Argument 2: Managing the positive and negative externalities of forestry

28. Our longstanding view is that ETS-driven externalities should be dealt with by ancillary measures, not within the design of the ETS itself. The ETS should be focused on efficiently allocating NZUs which have a 1:1 fungibility with tonnes of emissions, within a fixed quantity cap set to align with a trajectory toward net zero.

29. Mitigating negative externalities, or incentivising positive externalities, that are unrelated to emissions removals should be achieved through other mechanisms.[8] Preserving the principle of 'a tonne is a tonne' ensures the ETS is left to do its job: to co-ordinate the investment decisions of millions of actors, in real time, to discover a least-cost trajectory toward our 2050 target.

30. Ancillary measures could include:

    - environmental planning and forestry management requirements to address the environmental and social impacts of production and carbon (permanent) forestry – which are being progressed through the implementation of the NES-PF, as part of the Government's 'right tree, right place, right purpose' strategy;

    - separate (non-ETS) incentives might be justified to recognise the biodiversity benefits of polyculture or native forestry, or to incentivise forestry offsets required above and beyond those for which there is demand in the ETS; and

    - insurance or bonding mechanisms might be required to mitigate the risk that investors in forestry fail to meet their surrender obligations, such as if the forest burns down.

31. Even if these measures are separate from the ETS, they will still have cost implications for the transition. Providing subsidies for native afforestation, for example, will represent an opportunity cost for the taxpayer, and will result in no net change to our emissions trajectory. It may well be that we value the biodiversity benefits of this native afforestation such that the subsidy is justified;

8 To illustrate the point: we view changing ETS settings to address the local environmental impacts of forestry as analogous to raising fuel taxes to reduce the road death toll. It could certainly be argued that doing so disincentivises the relevant behaviour – in this case, driving. But there are likely to be more efficient targeted policies (such as safety barriers) that do not distort the mechanisms' core functions (in this example, cost-recovery for road building and maintenance).

the point is that these costs and benefits should be transparently considered. A similar argument holds for subsidies for emissions reductions, given the waterbed effect.[9]

32. The consultation paper does not appear to consider whether these non-ETS mechanisms might sufficiently achieve the stated policy intent of limiting the contribution of forestry removals to our low-emissions transition. In particular, the Government recently announced it will amend the National Environmental Standards for Plantation Forestry (NES-PF) to:

    - include carbon forests alongside plantation forests;
    - to manage their effects as if they are plantation forests;
    - enable councils to develop local rules and policies to manage the location of forests; and
    - make operational changes to enable better management of the environmental effects of forestry.

33. It is conceivable that the Government's 'right tree, right place, right purpose' changes outside the ETS will go some significant way to reducing the land available for afforestation, either because the land is excluded through local rules and policies, or the costs of meeting management requirements in some areas or land types is too high. It is unclear to what extent these policy changes are incorporated into forward forestry projections.

Part 2: Other important issues for consideration

Recognition and protection of existing property rights

34. The discussion document discusses whether any of the potential design changes should apply only to newly allocated units, or to all units. For example, establishing a proportional cap on how much of an emitter's obligation can be met through forestry (or removal) NZUs raises the question of how NZUs in the stockpile are categorised (i.e., whether they are gross units or removal units). We believe including this commentary in the discussion document has driven a predictable downward response in the NZ ETS secondary market that was avoidable.

9 The waterbed effect has been thoroughly traversed in climate policy debates, so we do not revisit the detail here. For more, see https://www.energyresources.org.nz/dmsdocument/202.

35. As a starting point, the Government should categorically rule out changes that retrospectively undermine sunk investments in forestry. This includes:

    - ruling out changes to entitlements for NZUs for currently registered forestry; and

    - ruling out changes to the 1:1 fungibility of existing forestry NZUs with gross emissions.

36. If the Government's concern is about projected afforestation levels (rather than afforestation to date), we see no reason not to retain existing treatment for existing forests, and to implement any changes from this point forward.

37. This should have been done on the release of the discussion document to allay any predictable market panic about the status of existing investments. It should also be recognised that even contemplating this kind of retrospective policy intervention affects investment confidence not only in the affected sector, but across the New Zealand economy, and does so in the context of global competition for investment capital.

Industrial allocation

38. We have consistently argued that industrial allocation is a key measure to mitigate against emissions leakage risk. EITE firms continue to operate and invest in New Zealand based on long-term security that they will continue to receive allocation of NZUs to mitigate the competitive impact of emissions pricing. Driving industrial allocation down faster than the currently well-signalled phase-out rate would be highly damaging to investment confidence and could lead to emissions being moved offshore. We do not consider this would be a defensible approach to meeting our international commitments.

39. If industrial allocation needs to be revised, we suggest it could be linked to the actual risk of emissions leakage (e.g., by tying it to an index of New Zealand's top trade competitors). This would ensure any reduction in allocation is commensurate with the actual risk of emissions leakage.

40. The range of ETS scenarios discussed above show that industrial allocation to 2050, under current phase-out rates, can be consistent with net zero and offset by forestry removals. The scenarios also help to illustrate just how 'hard-to-abate' some of these emissions are, even at very high carbon prices (which might undermine these firms' international competitiveness if they are out of line with those faced by global competitors).

41. For more detail, see our latest submission on this topic here: https://www.energyresources.org.nz/dmsdocument/238.

Inclusion of a broader range of removals in the ETS

42. We support the inclusion of removals where they are scientifically robust and additional.

43. Work should be underway to ensure that the removals that count toward our NDC meet the same standard. That is, if New Zealand considers that a type of removal is additional, permanent, and scientifically valid, but it does not count toward our NDC, this points to an issue with our NDC, not the inclusion of that removal in the ETS.

44. If the Government moves New Zealand toward a strategy that prioritises gross emissions reductions, it should be careful to do so in a way that recognises geological sequestration is different in many ways to biological sequestration – more below.

Carbon capture, utilisation, and storage

45. Carbon capture, utilisation, and storage (**CCUS**) will be an essential tool in the global transition to net zero emissions. In New Zealand, it could play a key role in addressing hard-to-abate emissions in the medium term and achieving net-negative emissions through direct air capture in the long term (if this is pursued). Several commentators support this potential – for example:

    - the Intergovernmental Panel on Climate Change's Sixth Assessment report considers deployment of carbon dioxide removal to counterbalance hard-to-abate emissions is "unavoidable", and all global modelled pathways that limit warming to 2°C include carbon capture;

    - CCUS is a feature of the International Energy Agency's future scenarios, including its Net Zero Emissions by 2050 scenario; and

    - an independent report by Castalia, which explored a range of potential futures for the gas sector, found that enabling CCUS in New Zealand could deliver significant emissions reductions at lower total costs, compared to a 'policy as usual' pathway.[10]

46. Supporting documents recently released with the Gas Transition Plan issues paper strengthen the case for urgent action:

    - a WoodBeca report suggests 4.4 Mt of natural gas processing emissions could be avoided from 2027-2035 if CCUS is available; and

[10] The summary report is available at https://www.energyresources.org.nz/dmsdocument/237 and the full report is available at www.energyresources.org.nz/dmsdocument/236.

- a University of Waikato report identifies options within the existing regulatory framework to enable CCUS to get underway. This includes changes within the ETS regime.

47. We strongly encourage government to prioritise policy work to identify and address any barriers to CCUS in the ETS. We wrote to the Minister of Climate Change in April 2023, and in his May 2023 response he agreed the ETS review is an appropriate vehicle for this work.

48. We have also advocated for the development of a dedicated enabling regulatory regime for carbon capture, utilisation, and storage in New Zealand (noting this is outside the scope of the ETS review).

The Government should continue to explore measures to address the cost impacts of higher-cost transition strategies

49. We note the consultation document briefly covers options to mitigate impacts on households. We support exploration of these options, while preserving the incentive to reduce emissions, and expect the forthcoming Equitable Transitions Strategy will provide some indication of the Government's intended policy direction in this space. This becomes even more important if New Zealand shifts toward a greater focus on gross emissions reductions, with correspondingly higher carbon prices.

50. We support in principle some form of carbon dividend, which would return all or some ETS proceeds to all New Zealand households. This would underpin sustained community support for the transition by softening any cost-of-living impacts. Households would still be incentivised to reduce their emissions, as they would then capture the delta value between their emissions expenditure and the dividend allocated each year.

51. This would generally be progressive, because wealthier households spend more per annum on emissions, but design of the mechanism could consider some form of means-testing (albeit trading off administrative efficiency and redistribution).

Conclusion

52. The ETS market has been buffeted for several years now by a rolling maul of policy changes and consultations – including both 'routine' decisions around ETS unit and price control settings, as well as commentary on more fundamental policy and design questions (such as this consultation).

53. We appreciate that the ETS is not a perfect mechanism, and like New Zealand's broader climate policy settings, requires difficult trade-offs to be made about the pace and scale of the low-emissions transition.

54. However, we believe the long-term transition – and the large-scale private investment that will be required to achieve it – is best served by first resolving the

fundamental policy debate about what kind of transition New Zealand wants to have. We agree with the Commission on this point: the Government should first communicate indicative balances of gross emissions and removals out to 2050 before policy mechanisms can be aligned with this strategic direction. We would welcome an open debate about this question in the development of the second Emissions Reduction Plan, and the ETS Review should be put on hold until this is complete.

Appendix 1: Commentary on options to amend the ETS

General comments

55. The Government currently has a number of supply-side levers in the ETS:

    - it can determine how many NZUs will be made available via auction (i.e., gross emissions without backing by forestry removals) and via the cost containment reserve; and

    - it can determine the price control settings which can limit (auction price floor) or increase (cost containment reserve) the supply of unbacked NZUs.

56. The options laid out in the discussion document represent increasingly significant changes to the ETS to provide the Government with more levers – both demand and supply side – to influence the relative balance of gross emissions and forestry removals in the ETS. To drive greater gross emissions reductions will require more constrained supply and a higher carbon price.

57. Our concern is that in significantly increasing its influence over NZU supply and/or price, the Government is undermining the efficiency of the ETS and could drive a higher-cost transition to net zero than is otherwise necessary. It could also further politicise decisions about the shape and pace of the transition, and if this is subject to political swings, it could have the counter-productive consequence of undermining the long-term confidence and price stability investors need to decarbonise.

58. Again, per our comments throughout this submission, policymakers might judge that these costs are worthwhile, on the basis they address some risks and/or produce some benefits that justify the additional costs. The consultation document itself notes that there is some uncertainty whether reducing emissions now or waiting will be more expensive in the long run. But these costs and benefits should be dealt with transparently. The discussion document does not equip us to reach an informed view about the relative costs and benefits of the alternatives presented.

59. We reiterate that we strongly support the ETS as New Zealand's primary mechanism to drive down emissions toward net zero. We think it is preferable to a carbon tax in that it allows the market to discover a carbon price based on a volume cap consistent with net zero by 2050, instead of Government having to define a price on an ongoing basis. However, some of the options presented in the discussion document are so significant in their rebalancing of unit and price influence toward the Government that it raises the question: would a carbon tax be more straightforward?

60. We have provided below some high-level commentary on the options as presented, but reiterate our preference that the Government first specify its objective (i.e., the indicative balance of gross emissions and removals to 2050),

which will enable better specification and full cost-benefit modelling of these options.

Option 1 – reduce unit supply through auctions

61. The Government already can further restrict unit supply through auction. As the consultation document notes, there is a limit to how much influence this option might have on the incentive for gross emissions reductions, because auction volumes are already expected to reach zero in the mid-2030s.

62. Our primary concern with this option is that it envisages changes to industrial allocation among the existing levers that might be used to reduce NZU supply. We strongly oppose any further changes to industrial allocation, per paragraphs 38-41 above. If this option is progressed, we recommend industrial allocation is specifically ring-fenced with a commitment not to accelerate its scheduled phase-out rates to 2050.

63. If industrial allocation phase-out rates are further amended, this should not be based on achieving the Government's preferred balance of gross emissions and removals. Rather, it should be based on a revised and robust understanding of the changing emissions leakage risk – i.e., a change from status quo phase-out should be linked to the carbon price faced by relevant trade partners.

Option 2 – Government to buy NZUs

64. If the Government decides it wants to incentivise further gross reductions, this option will enable it to do so to some extent without significantly upending the current design of the ETS. The Government would exercise some influence on demand for NZUs, by participating in the buy-side of the market itself, but this would be limited by the Government's willingness to commit funding to this versus alternative opportunities for public investment.

65. This option would expose the Government itself to the costs of its decision to prioritise a more ambitious balance of gross emissions and removals, and to not include agricultural nitrous dioxide in the ETS. It would address the question of who should pay for NZUs that are surplus to those required to carbon emitters but required to offset agricultural nitrous dioxide emissions.

66. We suggest such an option should only be pursued once auction volumes have reached zero – otherwise it would be administratively inefficient for Government to both supply and buy units.

67. One potential benefit of this option is that it establishes a long-term mechanism to incentivise net-negative emissions within the ETS, with the Government purchasing volumes of forestry-backed NZUs beyond the mid-2030s if this is eventually deemed a necessary outcome.

68. Enabling overseas purchase of NZUs also exposes New Zealand to some risk (noting officials consider demand for NZUs will be low given NZUs will contribute to New Zealand's NDC). Some combination of voluntary markets, overseas governments, and large overseas carbon markets could drive significant additional demand, with market sizes in the billions of units, compared to New Zealand's tens of millions. This would place upward pressure on carbon prices.

69. Consistent with other options identified, the downsides to this high-level option include:

    - likely higher carbon prices (this could be significant if New Zealand sees unexpectedly high demand from overseas markets)

    - a new source of uncertainty in the ETS market – that is, the timing and scale of Government demand in the market, and how this demand-side lever would interact with any supply-side levers.

Option 3 – Changing incentives for removals

70. We oppose this option, as it undermines the 1:1 fungibility of NZUs with tonnes of emissions (a fundamentally sound design principle of the ETS). Much of our commentary in Part 1 of this submission details our rationale here.

71. The downsides to this high-level option include:

    - likely higher carbon prices

    - much more complicated national carbon accounting, with the greenhouse gas inventory treating forestry removals differently to the ETS;

    - potential difficulties in linking our ETS to overseas markets in future; and

    - a new source of uncertainty in the ETS market – that is, uncertainty regarding how the Government will use this new lever. The market will have to anticipate political decisions about the relative incentives for removals, and whether further unpredictable changes might be made in future.

72. If such an option were pursued, we strongly recommend that consideration should be given to retaining the 1:1 fungibility of NZUs for other removal technologies (such as geological carbon capture and storage, and carbon capture and utilisation), on the basis these do not raise the same issues identified with forestry.

Option 4 – Creating separate markets for gross emissions reductions and emissions removals

73. We oppose this option – it would give the Government essentially full control over the cost of carbon to emitters and the reward to forestry for removals. It puts Government in the very high-risk position of having to forecast what carbon and

removals prices are required to deliver an efficient transition toward net zero; if it gets this forecast wrong, it could have disruptive economic impacts, without the dynamic forestry 'pressure valve' that the ETS currently has.

74. Such a regime would rely on the Government having a relatively accurate forward understanding of where things are headed. Because of the lead-time associated with new forestry, it could be difficult to respond quickly to provide relief beyond any stockpile supply availability.

75. If such an option were pursued, we strongly recommend that consideration should be given to retaining other removal technologies (such as geological carbon capture and storage, and carbon capture and utilisation) in the ETS (or whatever system is used for emissions reductions), on the basis these do not raise the same issues identified with forestry.

SUBMISSION

TĀMATA HAUHĀ
HE WHENUA • HE TĀNGATA • HE TAURIKURA

Submission in response to discussion document *Te Arotake Mahere Hokohoko Tukunga – Review of the New Zealand Emissions Trading Scheme*

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About our organisation: Tāmata Hauhā Limited is based in Marton, Rangitikei and was established in 2021. We utilise the New Zealand Emissions Trading Scheme as an economic and environmental enabler to create regional economic prosperity and well-being that will benefit all New Zealanders.

Our forestry programme favours a mixed species permanent forestry approach, layering in new revenue streams by incorporating high-value indigenous food, fibre and nutraceutical understory crop species to restore habitat and increase native biodiversity.

We partner with landowners, providing all the capital funding required to develop sustainable future forests that will increase the productivity of marginal non-productive land, and support regions impacted by extreme weather events. All developments remain in New Zealand ownership.

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INTRODUCTION

We are living in a time of rapid change, with very real consequences**.** The climate emergency is not something that is just happening in our future; it is happening now which obviously demands our urgent attention. As one of only two countries in the world permitted to use forestry to offset 100% of our greenhouse gas emissions, and with the world moving away from depending on fossil fuels towards sustainable energy, we have to take action.

The Emissions Trading Scheme is one of Aotearoa New Zealand's key responses to climate change. While we can't plant our way out of the climate crisis, forestry, through the ETS, is the only tool New Zealand has available to sequester greenhouse gas emissions and address the pressing climate emergency. It is therefore critical that we ensure that when trees are planted that the forest is managed efficiently and sustainably.

With all the changes and modifications made to the ETS since its introduction, the regime is working better now, than ever. But like any market, to be truly effective, it needs time to work, and interference should be kept to a minimum.

We have the land, the knowledge, and the infrastructure to rapidly scale top-quality nature-based climate solutions – we now need to embrace these unique opportunities.

On 19 June 2023 the New Zealand Government announced a review of the New Zealand Emissions Trading Scheme (ETS).

The aim of the review was to determine whether changes should be made to the ETS to create greater incentives for businesses to transition away from fossil fuels while continuing to utilise the ETS as a way to support the carbon-removal activities of the forestry sector.

The ETS is an important economic and environmental enabler to promote sustainable net emissions outcomes in New Zealand. Currently, although the regime is working well, the NZ ETS falls short of the government's expectation of driving significant reductions in gross emissions – a function that it was not designed to perform. Officials claim this was caused by an increase in forestry investments and speculative holding of units, which then led to lower prices. However, the recent cooling of prices was largely driven by government intervention and increased political uncertainty.

The options put forward in the Ministry for the Environment's NZ ETS Review Consultation document seek to propose and encourage public discussion and input into a range of outcomes of the NZ ETS as follows:

Option 1:	**Use existing NZ ETS levers to strengthen incentives for net emissions reductions**
Option 2:	Create increased demand for removal activities to increase net emissions reductions
Option 3:	Strengthen incentives for gross emissions reductions by changing the incentives for removals
Option 4:	Create separate incentives for gross emissions reductions and emissions removals

The consequences of this review for the forestry sector are arguably significant and it is concerning that it is much of the review content is based on unfounded information which undermines the major contribution that the forestry sector delivers to our environment, our ecology, the economy, culture, and our communities.

We find that:

- The modelling used to justify this review lacked clarity or evidence of the issues claimed by the Ministry and excluded industry expertise regarding claims of oversupply of New Zealand Units saturating the market by 2034.

- Officials' ability to provide sound advice to the Government regarding the ETS was highlighted by the Climate Change Commission following Justice Palmer's High Court decision regarding Government pricing breaching the Carbon Zero Act, as well as a recent U-turn by the Government on the number of EITE/fabricated carbon credits provided free to large polluters.

- Forestry is now being blamed for the ETS shortfalls which the Government created itself when an industry led code of practice would address concerns and allow for the industry to self-regulate, with the support of our treaty partner, the Crown.

- Since the introduction of the ETS in 2008, Aotearoa New Zealand's gross emissions (the total emissions from all sectors of the economy), have decreased at a rate slower than reductions in the country's net emissions (the gross emissions minus the emissions captured through additional carbon-removal activities, largely undertaken within the forestry sector). Underpinning this review is a real concern about the variance in these rates of reductions - what the ETS review discussion document has failed to acknowledge is that this differentiation positions the New Zealand economy in opposition to the forestry sector.

We also note that the recently added permanent forest category (PFC) within the ETS provides unique advantages and significant benefits that would come from partnering with industry – we need to explore this further.

We recommend:

- Any further activity on the ETS review is stopped
- Support is given to operators to scale their carbon sequestration programmes
- Measures are in place to avoid delays in scaling these programmes
- The Government stops selling and giving away carbon credits not linked to genuine offsetting activity
- A stable market environment is created for the ETS to continue operating effectively

About Tāmata Hauhā

Tāmata Hauhā exists to empower whānau and landowners by providing funding, strategies, advice, and options to develop their land and enhance their current land-use operations.

Since 2021, Tāmata Hauhā has partnered with landowners, specifically Māori landowners, to utilise the ETS as an economic and environmental enabler for the restoration of their whenua. We have always treated carbon forestry as the waka that will help our clients achieve their specific best-land-use goals.

Our leading partnership programmes recognise public concern about poor management of production forestry (slash), the possibility of negative financial and social impacts on rural communities, widespread farm-to-exotic conversions and increased foreign ownership of NZ forestry assets. In reflecting these concerns, our interrelated afforestation programmes offer the following:

- Mixed-species permanent forestry to encourage carbon sequestration, reduced slash, improved soil health and stability and workforce and skills-training opportunities for landowners and local communities, driving innovation in forestry to improve market environments and policies.
- Transitional forestry to ensure long-term biodiversity and conservation outcomes.
- Supply chain opportunities incorporating high-value food and fibre nutraceutical understory to restore indigenous habitat and increase native biodiversity, layering in new revenue streams, trailing practices in real-time, and operationalising conservation solutions.
- Agroforestry to increase on-farm productivity, measuring environmental and economic impacts, testing interactions for animal welfare benefits, soil management, microclimate modification, weed control, carbon sequestration and nutrient recycling.

Tāmata Hauha is currently initiating solar farming opportunities for local landowners, which will add to New Zealand's transition to a low-carbon energy network while also supporting regional industrial developments. We have noted the public perception that emitters avoid cutting emissions at source by taking advantage of the unique role of forestry in New Zealand's ETS.

Although we disagree with this general misinterpretation of how the ETS presently functions, our recent development of renewable energy challenges the public view that investment in greenhouse gas offsetting is disconnected from initiatives to reduce emissions at source.

The return from the carbon investment addresses the issue of lack of capital and 'actually-doing-stuff funding' for Māori. We see carbon being the backbone needed for things to happen on Whenua Māori. Tāmata Hauhā works closely with landowners to design sustainable forests using both traditional Māori ideology and Western practices. Our view is that the forest and all that is contained within it is the marae of Tāne Mahuta.

THE CLIMATE CRISIS | AOTEAROA NEW ZEALAND'S RESPONSE

Legislation

The ETS is being reviewed within the legislative context of the Climate Change Response Act 2002 and its several Amendments. We appreciate there is a widespread understanding of the relevant legislation underpinning the review of the New Zealand Emissions Trading Scheme; however, we believe a summary is important as it provides context for our submission.

The purpose of the ***Climate Change Response Act 2002*** is to provide a framework that contributes to international efforts to limit the global average temperature increase to 1.5 degrees Celsius above pre-industry levels, and to prepare Aotearoa New Zealand to meet our 2050 targets and emissions budgets, including establishing, implementing, and administering an Emissions Trading Scheme (ETS) that encourages global efforts to reduce greenhouse gas emissions.

The ***Climate Change Amendment (Zero Carbon) Act 2019*** provides for the establishment of the Climate Change Commission to provide independent, expert advice to the government on mitigating climate change and adapting to the effects of climate change, and to monitor the Government's progress towards its emissions reduction and adaption goals, including pricing controls for the emissions trading scheme that must be set in a manner consistent with meeting New Zealand's emissions budgets and other climate targets.

The approach was set down in the Paris Agreement, which calls for signed countries to reach net-zero greenhouse gas emissions by 2050. Accordingly, the Act sets new domestic emissions reduction targets for New Zealand, including reducing net emissions of all greenhouse gases other than biogenic methane to zero by 2050.

Policy:

Since its inception in 2008, the primary function of the ***New Zealand Emissions Trading Scheme*** has been to manage New Zealand's net emissions to reduce the actual impact greenhouse gases are having on our climate.

Currently, approximately 550,000 hectares are registered in the scheme. Of this, 49,000 hectares have been registered under the permanent forestry category. The remaining balance is largely made up of a mixture of production forestry, and some native forestry.

COMMENTARY ON THE ETS REVIEW OPTIONS

In Summary:

OPTION	LIKELY IMPACT
Option 1:	Slowing the introduction of emission-intensive, trade-exposed (EITE) credits, or what we call fabricated credits, would increase the value of forestry-generated credits.
Option 2:	Opening the ETS market to overseas investors and encouraging the Government to invest in NZ based offsets would increase the level of disruption in the ETS market.
Option 3:	Creating distinct price levels for forestry-generated NZUs and Government-generated NZU's i.e. those directly linked to offsetting activity against those not linked at all undermines the value of forestry as a key contributor to Aotearoa's efforts to transition to a net-zero future.
Option 4:	Establishing a new market for forestry generated NZUs risks collapsing the price of NZUs and contradicts the Government's legislative intention to ensuring forestry is at the centre of the country's ETS.

While Option 1 is the most feasible of the four suggested options, as it stands, Tāmata Hauha does not support pursuing any of the proposed options.

In essence, Tāmata Hauhā is fundamentally opposed to any change that places greater value on NZUs that are not linked to genuine offsetting activity, and which undermines the value of these forestry generated carbon credits.

OPTION 1:

Use existing NZ ETS levers to strengthen incentives for net emissions reductions:

We believe this to be the only feasible option proposed by the Government.

This option seeks to 'reduce net emissions' by utilising existing mechanisms under the ETS to reduce the number of NZUs supplied at the primary market auction and managing price controls or controlling industrial allocations.

The suggestion is that this approach would slow the increase of NZUs circulating in the secondary market and therefore raise the value which would incentivise participants in the scheme to increase their removal activities on the basis of sustained pricing (e.g. by investing in nature-based carbon removal activities such as forestry).

By moderating or decreasing the supply of new NZ Units from primary market auctions into the secondary market, especially the Government's EITE (Emissions Intensive Trade Exposed) credits, the risk of over-supply could be reduced. This approach would also provide the market room to naturally correct.

OPTION 2:

Create increased demand for removal activities to increase net emissions reductions:

Although this option proposes making forestry generated NZUs available to offshore buyers, the discussion document claims there would be a lack of demand from offshore buyers because the removals purchased offshore would not count toward that country's Nationally Determined Contribution (NDC) under the Paris Agreement.

However, in our experience there is increasing interest from offshore parties particularly in the New Zealand voluntary carbon market which could translate to interest in NZUs if they were to become available offshore. Of note, Tāmata Hauhā is proactively exploring voluntary carbon market options offshore. We do not believe it is the role of Government to be the primary broker for selling forestry generated NZUs to offshore buyers.

The discussion document also suggests this option could include integrating the Government into the secondary market. While we would support the Government purchasing forestry generated NZUs as an alternative to purchasing offsetting credits offshore, we believe this would need to be complemented by the Government temporarily stopping the introduction of EITE credits through the primary market and industrial allocations.

If Option 2 is pursued, we believe NZ participants should have first right of refusal to buy NZUs over offshore buyers or the Government.

OPTION 3:

Strengthen incentives for gross emissions reductions by changing the incentives for removals:

This option proposes creating two price levels: one for reduction activities, and then a lower price setting for removals.

Option 3 should not be considered for the reasons discussed below.

There is a high risk that implementing two distinct price levels could discourage the utilisation of forestry as a removal method. This concern is significant considering the pivotal role forestry plays in mitigating the impact of climate change. Therefore, this approach is unlikely to be effective unless the Government commits to providing additional incentives, beyond the ETS, to enable New Zealand to achieve its emissions reduction targets.

Tāmata Hauhā believes this option would lead to the collapse of the net emissions function of forestry, which is a significant contributor to alleviating global warming, and could have detrimental effects on Māori land use opportunities.

OPTION 4:

Create separate incentives for gross emissions reductions and emissions removals:

Tāmata Hauhā is extremely concerned about the possibility this option would even be progressed.

Fundamentally, it would undermine a market-based approach to the integration of forestry within the ETS, and while increasing Government revenue, landowners would miss a valuable new opportunity to benefit from full and proper participation in the ETS. We also foresee a significant risk in carbon leakage.

Separating the two markets could result in emission-intensive industries ignoring the importance of removal activity and choosing to solely focus on their gross emissions reductions, which would have a significant impact on New Zealand's climate mitigation efforts.

In addition, the uncertainty around "who" purchases these removals (government, emitters, or both) and the absence of a clear link between removal activities and the broader ETS is likely to lead to high levels of uncertainty and reduced confidence in the market - disincentivise those involved in undertaking and investing in emissions reduction and removal activities.

Our Position

We are fundamentally opposed to the latest ETS review as much of the information is based on unfounded concerns and assumptions. Our industry partners who have examined the modelling which supports the recommendation to review the ETS, have indicated that the quantum of credits used to determine the 'overabundance' is at best implausible, and at worst, inaccurate.

We also find it highly problematic that the review document does not discuss the differences between each type of NZU in the ETS as they are not created equal:

1. **NZUs directly generated from forestry** (trees sequester carbon from the atmosphere) genuinely assist in reducing our greenhouse gas emissions.
2. **Credits not associated with any form of sequestration** - these Emission Intensive Trade Exposed credits, which we've termed "fabricated NZUs", do not directly contribute to climate change mitigation because they are not connected to any real form of carbon removal. We understand that a total of 380 million EITE credits will be issued between now and 2034.

Other than revenue generation and giving emitters a 'permission to pollute', it is difficult to understand the rationale for issuing these fabricated NZUs - they do not support the reduction of carbon emissions, and at the same time, they cause an oversupply of units which forces the market price to decline.

We are also concerned about the validity of creating these credits as they appear to contradict the intent of the Climate Change Response Act 2002 and the subsequent Climate Change Response (Zero Carbon) Amendment Act 2019.

Instead of issuing fabricated units, if the Government were to issue carbon credits backed by a real removal unit such as a tree, the oversupply would be avoided through generation via forestry. Additionally, if the Government continues their current approach of issuing fabricated credits to meet our obligations under the Paris Agreement, the country would be required to buy 100 million offsetting credits from overseas at a potential total cost of anywhere between $2-26 billion.

Not only is this a cost we believe New Zealand cannot afford, but it would also direct funds offshore which would be better invested back into our own communities and economy.

Our concern is that these fabricated credits will tip the ETS to the point of oversupply when the secondary market could directly service the demand of the primary auction. In addition, we are concerned that the practice of issuing free fabricated credits is inconsistent with meeting New Zealand's climate change targets prescribed under the Climate Change Amendment Act 2019.

OUR RECOMMENDATIONS

In Summary:

1. Cease activity on the ETS review
2. Support scaling carbon sequestration programmes
3. Put measures in place to avoid delays in scaling the programmes
4. Stop selling and giving away carbon credits not linked to genuine offsetting activity
5. Create a stable market environment for the ETS to continue operating effectively

1. Cease activity on the ETS review

We recommend ceasing the current ETS review as it has already caused large-scale disruption to the forestry sector in general, and the progression of best-practice carbon forestry programmes. Moreover, the uncertainty has caused balance sheets of forest owners across the country to be slashed. Every time a new review is announced it comes at a cost to participants and businesses and is particularly disruptive during the planting season causing landowners to lose confidence.

It has become apparent to Tāmata Hauhā and many of our industry partners that the authors of the current ETS review lack sufficient background knowledge and experience in the forestry sector. This is cause for significant concern given that forestry is expected to bear the brunt of the review's outcomes.

Any further design and implementation of changes to the ETS by the Government should be carried out in partnership with industry. We suggest a partnership between industry, Māori, and Government similar to that of He Waka Eke Noa would be sufficient to progress any necessary fine-tuning of the ETS.

2. Support the scaling-up of forest carbon sequestration programmes

The Government has often referenced the need for Aotearoa New Zealand to plant an additional 1 million hectares of forestry to meet its various climate obligations. Without dramatically scaling up the forestry sector's carbon sequestration programmes, we will not be able to meet our targets. It is essential we gain clarity from Government as the regulator, as to how they will support this objective.

We recommend partnering with industry to develop afforestation programmes that are cost-effective and will benefit all New Zealanders, while fully utilising the ETS as a well-regulated and efficient market mechanism.

3. Avoid delays in supporting scaling-up

A climate crisis is not the time for Government to pause and come up with the "perfect" solution. We need to act now – which means rapidly planting trees that sequester carbon quickly, are long-lived, and can be reliably managed well beyond 2050. Forestry companies cannot wait for the perfect method to tested and proven before beginning to scale up their transition forestry programmes.

The window of opportunity to take the necessary action is closing fast. Transitioning to a low-carbon, climate-resilient future is a once-in-a-generation opportunity to build an Aotearoa New Zealand that is cleaner and more prosperous than it is today.

The review has already delayed planting and its continuation will only create further delays.

Furthermore, we need an apolitical approach to the forestry market. Continuing to treat the ETS as a political football provides little hope for carbon price stability given the market-based dynamics of the scheme. As a regulator, the Government is in the unique position where it can ensure a stable price and any decisions made regarding reform must be limited to maximising this unique position.

4. Stop flooding the market with non-offsetting credits

The Government has stated under current policy settings that for New Zealand to meet its climate change targets, an additional 0.97 - 1.44 million hectares of afforestation would be needed by 2050.

Contradicting this statement is the ETS review which suggests that continued afforestation linked to the ETS will lead to an NZU oversupply – decreasing the price of carbon credits, and disincentivising business from investing in new technologies to reduce greenhouse gas emissions at source.

Rather than injecting more EITE NZUs into the market which have no association with any offsetting activity, we argue that it is common sense that any NZU sold, traded, and surrendered, should be linked to additional afforestation and forest management activity.

The Government is anticipating spending billions of dollars on offshore carbon-credits to meet its international climate obligations. Surely instead of spending money offshore, the Government could support local afforestation projects, keeping the money onshore, and putting money back into the local economy. By creating our own offsets rather than buying millions offshore, the Government has a unique opportunity to utilise carbon forestry to support regional development.

5. Create a stable market environment for the ETS

The key to participation is a level of confidence that the market will remain stable.

Of utmost importance will be our ability to meet our climate change goals while meaningfully contributing to economic growth is providing market stability for all ETS participants. This requires working together to determine how forestry can be part of the solution. Forestry, when done well, can help restore the land, its people, and their prosperity—he whenua, he tangata, he taurikura.

A stable market environment will create certainty for the forestry and climate-finance sectors as they plan work and investment for the years ahead. For Tāmata Hauhā and our financial backers, it is essential for us to see the Government utilise their regulatory powers to ensure consistent and stable policy conditions for the ETS market to function at its best. This gives us the confidence to move fast and hard in implementing our carbon-forestry programmes.

To provide the industry with adequate time to prepare for sufficient planting, the ETS could be capped 2 years after the total inventory in the ETS reaches 1.2 million, or 1.5 million hectares if there was direct support for afforestation programmes, allowing the Government to generate its own very-real removal units at a significantly discounted rate.

CONCLUSION | HE WHENUA, HE TANGATA, HE TAURIKURA

Forestry must be treated like any other business:

Government can support the rapid scaling up of a transitional forestry sector by being a reliable regulator and only a limited regulator in order for the ETS to ensure a stable NZU price long-term. Let's not treat the ETS like a political football and let the market do what it does best.

Trees remain the most cost-effective way for us to mitigate climate change in the immediate term. We have the land, the knowledge, and the infrastructure to rapidly scale up top-quality nature-based climate solutions. Let's embrace this unique opportunity.

The climate crisis is not going to get any cheaper to manage:

While forestry is often regarded as the cheapest option for businesses to currently reduce their carbon footprints, there is still a cost associated with afforestation.

The cost to plant and manage forests for carbon sequestration will only increase as the impact of climate change becomes more severe. While we can't plant our way out of the climate crisis, we need to ensure that what forestry is planted is managed efficiently and sustainably.

Utilising the ETS to finance the planting and management of transitional forests will not cost the taxpayer a cent. In contrast, the purchase of 100 million tonnes of carbon mitigation offshore will cost the Government anywhere between $2b - $26b.

We need to move quickly to reduce emissions:

The window of opportunity to take the necessary action is closing fast—the time is now. Transitioning to a low-carbon, climate-resilient future is a once-in-a-generation opportunity to build a country that is cleaner and more prosperous than it is today—we just need to get on and make it happen.

Despite the need for urgent domestic action to cut emissions, nothing will change until we can show people how to do it. If Aotearoa New Zealand takes further urgent action, then we still have a decent chance of avoiding the worst effects of climate change.

There is an opportunity for the current Government to support innovative projects that clearly demonstrate its commitment to developing new approaches to sustainable climate change mitigation.

With all the changes and modifications made to the ETS since its introduction, the regime is working better now, than ever.

But like any market, to be truly effective, it needs time to work, and interference should be kept to a minimum.

Appendix 1. Consultation Questions

Consultation questions Chapter 2

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

- *No. The ETS is not the appropriate policy lever to manage gross emissions reductions. It is functioning sufficiently as a driver of net-emissions reductions. The latest climate legislation sets a net-zero target.*

2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

- *No. We engage primarily with landowners and foresters who are doing the heavy lifting of mitigating climate change.*

2.3 Do you have any evidence you can share about land-owner and forest investment behaviour in response to NZU prices?

- *Our clients have sought legal advice regarding the ETS review and its potential impact on our joint afforestation projects.*

2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

- *No. The summary of exotic afforestation appears to be influenced by misinformation and unsubstantiated assumptions.*

Consultation questions Chapter 3

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not?

- *No. The most appropriate policy tool for driving gross emissions reduction is the Emissions Reduction Plan*

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

- *No. While an increase in NZU price will likely be passed on to consumers by eligible emitters, the Government is in a position to use other policy levers to address the pressure on the cost of living.*

3.3 How important do you think it is that we maintain incentives for removals? Why?

- *It is essential. New Zealand is in a unique position to innovate sustainable and equitable methods of nature-based climate change mitigation through afforestation supported by the ETS.*

Consultation questions Chapter 4

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

- *Yes. The opportunities afforded by landowners across the motu are significant, but unheralded for many Māori land trusts. These opportunities may have been severely diminished by the content of the Review.*

4.2 What other interests do you think are important? What has been missed?

- *The complexity of landownership arrangements for Whenua Māori.*

4.3 How should these interests be balanced against one another or prioritised, or both?

- *The options for how Māori utilize their land should remain as unhindered as legally possible.*

What opportunities for Māori do you see in the NZ ETS review. If any, how could these be realised?

- *See answer to 4.1 – the opportunities afforded by the ETS have been fundamentally disrupted by the review itself.*

Consultation questions Chapter 5

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

- *No. The ETS was designed to manage net emissions, which it is achieving.*

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

- *No. The appropriate tool for this is the Emissions Reduction Plan*

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

- *Yes. It has proven to be successful at achieving this.*

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

- *No. Government should be working much more closely with foresters and landowners to determine what is succeeding and why to ensure the sustainability of forestry within the ETS.*

5.5 Are there any additional criteria or considerations that should be taken into account?

- *The significant co-benefits of the ETS to Māori landowners and communities.*

Consultation questions Chapter 6

6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in Chapter 5?

- *All the options fall short of achieving any kind of significant ongoing support for removals.*

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in Chapter 5? Why/why not? Please provide any evidence you have.

- *No. The options fail to properly account for the significant negative impact any reform will have on Māori landowners and communities.*

6.3 Of the four options proposed, which one do you prefer? Why?

- *To be honest, none - at a push, Option 1. We believe this is the option that will have the least disruption to the ETS as it currently functions.*

6.4 Are there any additional options that you believe the review should consider? Why?

- *The Government should stop its own quarterly auctions until the secondary market has stabilised. We are concerned that the 380 million credits the Government anticipates releasing through auction and free-allocation by 2034 are not connected to any carbon sequestration activities. We believe all credits should be connected to such activities.*

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

- *Regardless of which option the Government adopts, it should assess its actions based on New Zealand's yet to be published Declaration Plan regarding the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).*

6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts been missed, and which are most important?

- *See above.*

Consultation questions chapter 7

7.1 Should the incentives in the NZ ETS be changed to prioritised removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

- *No. The ETS is not the appropriate policy mechanism to specifically incentivise land-use changes not directly related to carbon sequestration.*

7.2 If the NZ ETS is used to support wider co-benefits, which of these options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

- *Option 1. This option has the least impact on the ETS as it currently functions. Until now, the co-benefits of afforestation—not just environmental but social, cultural, and economic—have already been significant.*

7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?

- *No. The ETS was serving its purpose as it functioned prior to the announcement of the review.*

7.4 What other mechanisms do you consider would be effective in rewarding co-benefits or recognising other sources of removals? Why?

- *No other mechanisms directly related to the recent functioning of the NZ ETS.*

eKOS Nature Carbon Programme

Submission: NZETS Review

August 2023

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CONTENTS

Structure of this Submission

This submission is presented in the context of the public discussion document released by the Ministry for the Environment entitled:

> Te Arotake Mahere Hokohoko Tukunga. Review of the New Zealand Emissions Trading Scheme. Discussion document. Ministry for the Environment, Ministry of Business Innovation and Employment, Ministry for Primary Industries 2023.

Text in black font is the text of the public discussion document. Text in red font is the Ekos submission text.

Chapter 1: Introduction and context

Each year, we are seeing more and more extreme weather events like Cyclone Gabrielle. Seas are rising. Our regions, businesses and communities are facing costly damage and disruption.

The science tells us that limiting global warming to 1.5 degrees Celsius above pre-industrial levels gives us the best chance of avoiding the worst effects. Because temperatures have already risen more than 1 degree Celsius, we must make urgent cuts to our greenhouse gas emissions to avoid further warming, and we must take active steps to increase our resilience to the impacts that are already locked in.

Making these cuts requires a comprehensive and well-balanced mix of emissions pricing, targeted regulation, tailored sectoral policies, direct investment, and innovation.

The New Zealand Emissions Trading Scheme (NZ ETS) is the government's main emissions- pricing tool and needs to play a critical role within this mix. It is already expected to contribute to Aotearoa New Zealand's climate change goals, both domestic[2] and international, and we have an opportunity to strengthen this contribution.

The Government has agreed to prioritise gross emissions reductions in the emissions reduction plan, alongside maintaining support for removals. This decision was informed by 2021 advice on emissions budgets from He Pou a Rangi | Climate Change Commission (the Commission).

The Commission recommended that the NZ ETS be amended to strengthen the incentives for gross emissions reductions and manage the amount of exotic forest planting driven by the scheme. The Commission's recent draft advice on the second emissions reduction plan reinforces the importance of gross reductions. In May 2022, the Government agreed to review the NZ ETS to assess the desired role of emissions pricing in driving gross reductions, while maintaining support for removals.

What are gross emissions, removals, net emissions, and abatement?

Gross emissions mean the total emissions Aotearoa releases from sectors such as agriculture, transport, energy, industry, land use and waste.

Removals are the result of activities that take carbon from the atmosphere and store it, such as forestry.

Net emissions mean the total of gross emissions, minus any removals.

Abatement means the emissions reductions and removals we achieve within Aotearoa (our net emissions reductions).

The NZ ETS was designed to provide flexibility for businesses to find the lowest-cost emissions reduction options. The design of the NZ ETS supports investment first in the lowest-cost sources for net emissions reductions.

[2] Aotearoa has a domestic 2050 target that requires all greenhouse gas emissions (except biogenic methane) to reach net zero by 2050, and biogenic methane emissions to reduce to 24 per cent to 47 per cent below 2017 levels by 2050 (including a 10 per cent reduction by 2030). A system of emissions budgets (discussed later) will step progressively towards the target.

A strong and stable emissions price signal should encourage greater climate action across the economy, including in households, businesses, and the private and public sectors.

The NZ ETS is currently neutral about where net emissions reductions come from in the economy. This is reflected in there being one New Zealand Unit (NZU) price that applies to gross emissions and emissions removals equally.

Current emissions prices in the NZ ETS, and the relative costs of reductions and removals, are predominantly driving exotic forest planting rather than gross emissions reduction investments. This is because it is often cheaper to remove 1 tonne of carbon through forestry than it is to avoid emitting 1 tonne of carbon through innovations and investments in low-emissions production and technologies in the energy, transport and industry sectors. This is discussed further in chapter 2.

Forestry is an important means of removing carbon dioxide from the atmosphere, but it can also achieve other strategic objectives. These include providing long-term carbon sinks (including those that enhance indigenous biodiversity); improving freshwater outcomes; building resilience to the impacts of climate change; and providing economic opportunities for land owners, including tangata whenua.

Environmental, social and economic impacts are also associated with forestry. Existing workstreams will assess how the NZ ETS and wider regulatory framework achieve the right type and scale of forests, in the right place. These include:

- work underway to redesign the NZ ETS permanent forestry category (proposals are currently out for public consultation)
- workstreams relating to the National Environmental Standards for Plantation Forestry
- the Ministerial Inquiry into Land Use in Tairāwhiti and Wairoa (the Inquiry).[3] The Government is currently considering its response to the Inquiry's recommendations.

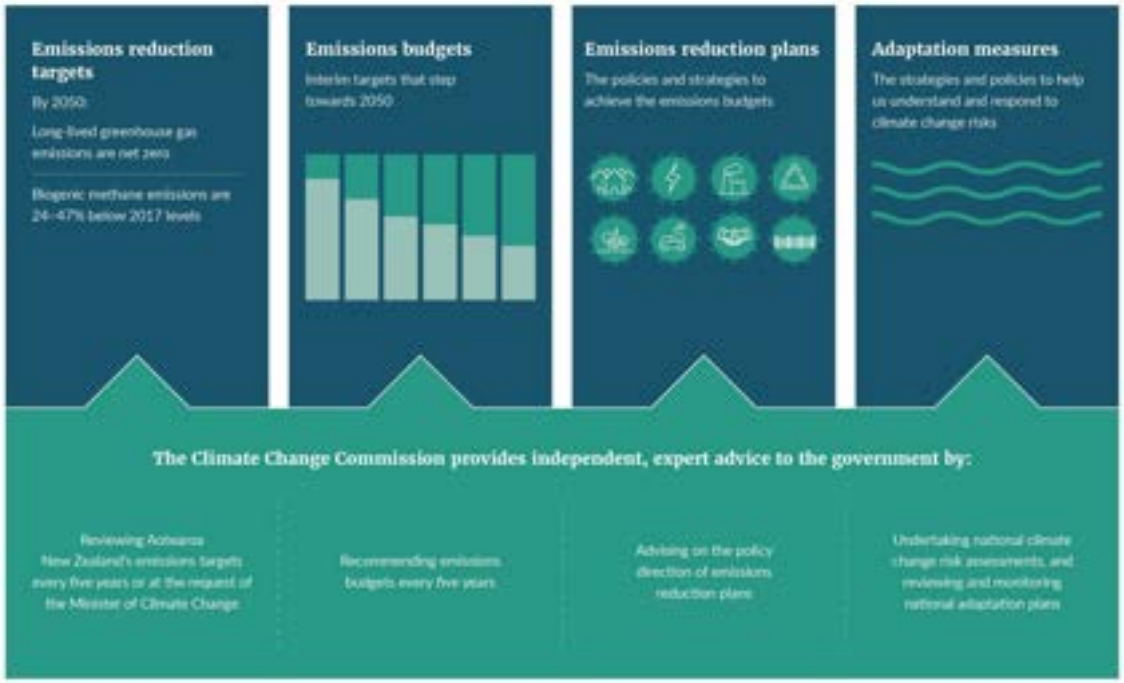
AOTEAROA NEW ZEALAND'S CLIMATE CHANGE RESPONSE

Our domestic transition to a low-emissions, climate resilient future

Aotearoa is committed to achieving a low-emissions, climate-resilient future and contributing to global efforts to limit average temperature rise to 1.5 degrees Celsius above pre-industrial levels. To help achieve these goals, the Government amended the Climate Change Response Act 2002 to include the zero carbon framework in 2019 (figure 1).

[3] The Inquiry was announced on 23 February 2023 and sponsored by the Environment and Forestry Ministers. The purpose of the Inquiry was to describe the history of land uses associated with the mobilisation of woody debris (including forestry slash) and sediment in the Tairāwhiti and Wairoa districts, and to make recommendations about the further work needed to address impacts of land use and storms. The Inquiry's findings and recommendations were released on 12 May 2023 (see Ministerial Inquiry into Land Use, for more information).

Figure 1: The Climate Change Response Act 2002 sets out tools for the transition



At the highest level, it is important for the nation's climate change response to include as many strategic co-benefits as possible. This includes:

- Fully valuing ambitious emission reductions and removals while achieving this at least cost to the taxpayer and ratepayer.
- Maximising synergies between climate change mitigation and climate change resilience and adaptation. Here, for example, strategically designed programmes delivering removals by means of land use change can also deliver climate resilience at no cost to the ratepayer or taxpayer.

Several elements of this framework are directly relevant to the NZ ETS.

- **He Pou a Rangi – Climate Change Commission:** The Commission is tasked with providing independent expert advice on climate change matters (including emissions budgets, emissions reduction plans and NZ ETS settings) and monitoring progress towards the government's mitigation and adaptation goals.
- **The 2050 target:** This domestic target requires gross emissions of biogenic methane to reduce to 24 per cent to 47 per cent below 2017 levels[4] and all other greenhouse gas emissions to reach net zero by 2050.
- **Emissions budgets:** These specify the net amount of greenhouse gas emissions permitted over a five-year period (or four years, in the case of the first emissions budget). Emissions budgets will get smaller over time, helping Aotearoa step towards the 2050 target. NZ ETS settings can help reduce emissions to meet these emissions budgets.
- **Emissions reduction plans:** Plans that set out policies and strategies to meet the emissions budgets. A new plan must be published before the beginning of each emissions budget. The first plan includes several actions related to strengthening incentives in the NZ ETS to reduce emissions.

[4] Including a 10 per cent reduction by 2030.

The NZ ETS needs to play a critical role in meeting Aotearoa New Zealand's emissions budgets

In May 2022, the Government published the first three emissions budgets (table 1) and the first emissions reduction plan for Aotearoa.

Table 1: Aotearoa New Zealand's first three emissions budgets (Mt CO_2e)

	First emissions budget (2022–25)	Second emissions budget (2026–30)	Third emissions budget (2031–35)
All gases, net (AR5)	290	305	240
Annual average	72.5	61.0	48.0

Note: AR5 = Fifth Assessment Report of the United Nations Intergovernmental Panel on Climate Change.

The emissions reduction plan represents a coherent, strategic package of over 300 actions to meet our first emissions budget and set Aotearoa on a path to meeting the 2050 target.

The actions in the plan reflect the Government's decisions to:

- prioritise gross emissions reductions
- continue to support removals
- achieve a careful and well-managed transition that is fair, equitable and inclusive, and that supports the wellbeing of New Zealanders.[5]

The emissions reduction plan recognises the value of different tools (pricing, regulation and investment) as we build the foundations for meaningful change and as emphasis shifts over time. The NZ ETS is one of these tools and will play a critical role across multiple emissions budget periods.

The NZ ETS also supports achieving international commitments

Under the Paris Agreement, Aotearoa has set a nationally determined contribution (NDC) of reducing net emissions by 50 per cent below gross 2005 levels for the period 2021–30. This represents our highest possible ambition for contributing to the global effort and will be met through a combination of domestic abatement and offshore mitigation.

The NZ ETS is expected to make a significant domestic contribution to meeting our NDC mostly through its impacts on forestry removals. See chapter 3 for more information about the ongoing role the NZ ETS should play in supporting our NDCs[6] and possible design changes.

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[5] An equitable transition strategy is currently being developed by the Ministry of Business, Innovation and Employment. This is intended to include tangible initiatives to address challenges and leverage opportunities that are targeted towards those groups most in need of support (see Ministry for the Environment. 2022. *Te hau mārohi ki anamata | Towards a productive, sustainable and inclusive economy: Aotearoa New Zealand's first emissions reduction plan*. Wellington: Ministry for the Environment. Action 3.2.1).

[6] Ministry for the Environment. 2022. *Te hau mārohi ki anamata | Towards a productive, sustainable and inclusive economy: Aotearoa New Zealand's first emissions reduction plan*. Wellington: Ministry for the Environment. Action 5.2.4.

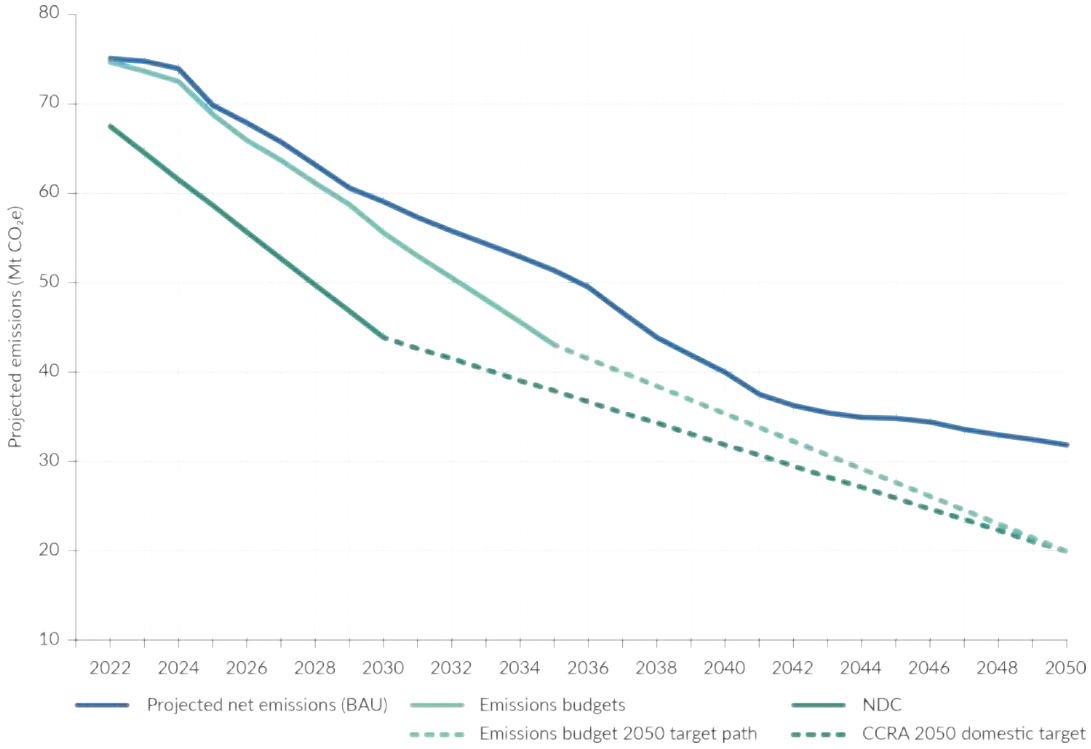
Meeting our domestic and international climate change goals will require significantly more abatement

While its net emissions are projected to decrease over time, Aotearoa needs greater emissions reductions and removals to meet its domestic emissions budgets and 2050 target, as well as successive NDCs (figure 2).

The gap between Aotearoa New Zealand's projected net emissions and the 2030 NDC is estimated to be about 99 Mt CO_2e. This gap could be closed through either greater domestic action or by buying emissions reductions and removals that have occurred in other countries (offshore mitigation).

The more we can reduce emissions or increase removals at home, the less offshore mitigation will be needed to meet the 2030 NDC and future NDCs. The government is currently expected to require between $3.3 billion and $23.7 billion in additional offshore mitigation to meet the 2030 NDC.[7]

Figure 2: Projected net emissions and target pathways to 2050



Note: BAU = business as usual; CCRA = Climate Change Response Act 2002.

[7] The Treasury and Ministry for the Environment. 2023. *Ngā Kōrero Āhuarangi Me Te Ōhanga: Climate Economic and Fiscal Assessment*. Wellington: The Treasury and Ministry for the Environment.

New Zealand Emissions Trading Scheme

Established in 2008, the New Zealand Emissions Trading Scheme (NZ ETS) aims to help Aotearoa to meet its emissions budgets, domestic 2050 target and international climate change obligations by pricing greenhouse gas emissions.

Emissions pricing is a tool that ensures businesses, households and the public sector incorporate the costs of emitting or the benefits of reducing or removing emissions into day- to-day decisions. Through a price signal, emissions pricing provides a clear, consistent signal of the cost of emissions or the relative benefit of lower-emissions choices or investing in removals, such as forestry.

How the NZ ETS works

NZ ETS participants who carry out certain prescribed activities that emit greenhouse gases must surrender one emissions unit (New Zealand Unit or NZU) for every tonne of greenhouse gas emissions (CO2e) they produce. Some NZUs are allocated to participants (eg, industrial allocation) and others are available to purchase from the Crown at auctions, which are held four times a year (the primary market), or from other participants in the secondary market. If participants reduce the amount of emissions that result from their activities, they reduce the cost of their surrender obligation. For more information on how the NZ ETS works, see About the New Zealand Emissions Trading Scheme.

Forestry NZ ETS participants can earn NZUs based on the amount of carbon absorbed by the forest. Forests can be both a carbon sink (while growing) or a source of emissions (eg, from harvesting or deforestation), so some forestry participants have surrender obligations, depending on when their forest was planted and the accounting methodology they use. For more information on forestry in the NZ ETS, see How the ETS applies to forestry.

Most trading happens in the secondary market (between participants), not with the Crown at auctions. Auctions have price controls to act as safety valves on the NZU price. The price controls affect the number of units auctioned and auction prices but do not prevent secondary market prices from going above or below these prices. If a trigger price is reached in auction bidding, a reserve amount of units is released (also known as the cost containment reserve).

The lower price control is called the auction reserve price. These upper and lower price controls create a price corridor. For more information about price controls, see The role of price controls in the NZ ETS.

The NZ ETS stockpile

The NZ ETS currently has a large supply of NZUs available in the secondary market, known as the 'stockpile'. This stockpile refers to NZUs that are retained for future use or investment purposes. It includes:

- units held to meet future surrender obligations (eg, by foresters who plan to harvest their trees, as well as other units held against contracts for future supplies)
- units available to the market.
- Stockpile units are potentially available as additional supply to the market. In mid-2022, He Pou a Rangi – Climate Change Commission (the Commission) noted that the number of

NZUs in the stockpile was around four times the number surrendered in 2021. However, the Commission also analysed the proportion of units that is likely to be 'surplus' (that is, the units that are available to the market versus those held against future liabilities). The analysis suggested that about one-third of the stockpile is 'surplus'.[8] This still represents a risk to achieving emissions budgets.

[8] In 2022, the Commission estimated the surplus component of the stockpile to be between 33 million to 66 million NZUs. The number of surplus units began increasing in 2012. This growth was attributed to the arbitrage of Kyoto Protocol units for NZUs (which has been prohibited in the NZ ETS since 2015), some banking of Kyoto Protocol units (which were cancelled in 2019), the one-off allocation of NZUs to pre- 1990 forest owners, the use of the fixed price option by NZ ETS participants in 2019 and 2020, and the sale of NZUs from the cost containment reserve in 2022.

The government manages this stockpile by reducing the number of new units supplied into the scheme via auction. This aims to ensure a portion of demand is met with NZUs from the stockpile, thus reducing it over time. However, the success of this approach also depends on the supplies of removal units to the market, which may enable the stockpile to grow if participants think the value of NZUs will increase in the future.

> The current and potential future size of the stockpile may limit the effectiveness of some of the options in driving gross emissions reductions. The significant number of units currently in the stockpile could also cause a time lag before options start to affect the amount of gross emissions reductions.

The price signal is not very effective currently for three reasons:

1. Many of the NZETS demand side participants can pass the carbon price onto their customers, often at little impact on their profitability (and sometimes with the benefit to them of windfall profits).

2. The carbon price is then passed onto customers this price is distributed to (and divided into) a large number of actors. This dilutes the carbon price down to homeopathic concentrations by the time it gets to the electricity bill or fuel bill. Such carbon price dilution reduces the price signal to the point where retail prices are much more affected by other drivers (e.g., international supply chain issues, the war in Ukraine, inflation resulting from government spending to recover from COVID-19 and Cyclone Gabrielle). Consumers, therefore, do not necessarily notice the impact of carbon pricing at their level in the economy.

3. Energy is price inelastic and therefore not particularly responsive to a carbon price signal unless it is very high.

When combining carbon price homeopathy with price inelasticity the result is very little impact on behaviour at the consumer end of the supply chain.

Because many demand-side NZETS participants can pass their carbon costs onto their customers, the carbon price has little impact on the profitability of these demand-side NZETS participants. In turn, this lack of impact on profitability means there is little impact on the investment community that finances these NZETS participants.

Note that investors are price elastic and would respond to a carbon price signal if it impacted them. The current design of the NZETS means that institutional investors are insulated from the carbon price signal and therefore are not responding to the carbon price as a result.

In summary: because the carbon price is so weak at the price inelastic consumer level, the carbon price does not cause consumer behaviour change. The main sector capable of responding to the carbon price signal are price-elastic institutional investors who are capable of moving their money from dirty technology and dirty development to clean technology and clean development. But the institutional investor community is insulated from the carbon price signal and as a result there has been 15 years of lost opportunity to cause a transformation in the economy towards a low carbon economy.

WHY THE GOVERNMENT IS REVIEWING THE NZ ETS

The Government has prioritised gross emissions reductions in the first emissions reduction plan

In the first emissions reduction plan, the Government committed to meeting Aotearoa New Zealand's domestic emission budgets by:

- reducing gross emissions in the transport, energy and industry, building construction, agriculture, waste, and fluorinated gases sectors as a matter of priority

- supporting additional afforestation towards net emissions reductions, in particular to offset hard-to-abate sectors and enhance Aotearoa New Zealand's high-wage, low-emissions bioeconomy.

Prioritising gross emissions reductions means taking active steps to adopt available low-emissions technology, encourage further innovation, invest in low-emissions infrastructure and encourage low-emissions behaviour.

Taking these steps now is important, because delays could increase the overall cost[9] and pace of Aotearoa New Zealand's transition to a low-emissions, climate-resilient future, as well as impacting its ability to sustain net zero beyond 2050. Cutting our gross emissions will also help to achieve a range of co-benefits, including for the health and wellbeing of New Zealanders. For more information, see chapter 3.

[9] For example, if required innovation fails to occur and high-emissions economic activities are locked in.

The NZ ETS is currently expected to deliver significant exotic afforestation and limited gross emissions reductions

Under current settings, the NZ ETS is expected to drive considerable removals,[10] mainly through carbon sequestration from exotic forestry. However, it is currently expected to play a limited role in driving gross emissions reductions or encouraging indigenous forestry.

There are recognised challenges associated with exotic forestry, including the social and environmental impacts of land-use change from other productive land use to unmanaged permanent forests, the loss of land-use flexibility required if emissions removals are to be maintained, and the risks to the permanence of the carbon storage, for example, from fire or pests. This is why the Government has a 'right tree, right place, right purpose' strategy for forestry. The types of forestry, their location and management are being considered in other workstreams. This consultation will consider the scale of forestry removals driven by the NZ ETS.

[10] The removals referenced here are from sequestration and not from other types of removals recognised in the NZ ETS (eg, the export or destruction of synthetic greenhouse gases).

Current market prices[11] are not sufficient to drive material emissions reductions in the energy, transport, industrial processes, and waste sectors. Failing to achieve significant gross reductions in these sectors risks delaying meaningful decarbonisation in Aotearoa. Decarbonising our energy system will require higher prices in the NZ ETS over time, alongside complementary policies to address existing barriers to low-emissions choices.

In addition, the current NZ ETS settings will not drive the level of indigenous forest restoration recommended by the Commission to create a long-term carbon sink for hard-to-abate emissions from 2025.[12] Nor can the current NZ ETS help us achieve net negative emissions in the second half of this century, as is expected of developed countries party to the Paris Agreement. This is discussed further in chapters 2 and 3.

The current settings of the NZ ETS are also limited in the removal activities they incentivise. No incentives are currently in place for activities, aside from forestry, that remove carbon from the atmosphere, such as wetland restoration, which has both carbon and biodiversity benefits.

Aotearoa needs significant afforestation to meet its emissions reduction goals

Given the current relative costs of gross emissions reductions and removals, it is expected the NZ ETS will incentivise significant removals through exotic afforestation. This is discussed further in chapter 2.

Exotic forestry is currently one of the lowest-cost and scalable sources of removals in Aotearoa. Forests are needed to achieve our short-term emissions budgets and contribute to our 2030 NDC, as well as future NDCs, which are expected to be even more ambitious. Forestry will also support Aotearoa New Zealand's long-term transition by providing a carbon sink for hard-to-abate gross emissions beyond 2050.

Forestry is also important for non-climate reasons. In 2022, the forestry and wood-processing sector contributed $6.5 billion in export earnings and employed around 40,000 people in wood production, processing and wider support industries. It provides high economic returns for land that may otherwise be hard to make a living from, and it provides erosion control. Indigenous forests also provide indigenous biodiversity.

The Government is acting to expand Aotearoa New Zealand's production and carbon sink forestry estate based on a 'right tree, right place, right purpose' strategy. These actions are progressing alongside the NZ ETS review and include:

- redesigning the permanent forest category in the NZ ETS
- developing a carbon removals strategy
- new and enhanced NZ ETS carbon look-up tables
- developing a voluntary carbon market
- exploring a role for biodiversity credits.

[11] At the start of 2023, the NZU price was about $75 per unit. Prices have since decreased, with NZUs sitting at about $55 per unit in early May 2023. Chapter 3 provides further discussion of NZU prices.

[12] This is because indigenous forests earn units more slowly than some exotic forests (because most indigenous species tend to grow more slowly than exotic species) and have higher establishment costs.

The Government has agreed to assess whether changes are needed to the NZ ETS

In its reportInāia tonu nei: a low emissions future for Aotearoa, the Commission recommended that the Government consider how the NZ ETS may be amended to provide more robust support for gross emissions reductions.[13] In doing so, the Commission highlighted the risk that the NZ ETS would drive relatively low-cost net emissions reductions through exotic forests, rather than the gross emissions reductions needed to reach net zero by 2050.[14]

The Commission also recommended that the Government amend the NZ ETS to manage the amount of exotic forest planting driven by the scheme.[15] The Commission reiterated this in its 2023 draft advice, which included a recommendation that the NZ ETS be amended to separate the incentives for gross emissions reductions from those applying for forestry, and that the Government develop integrated objectives for the role of forests with respect to emissions mitigation and adaptation.[16]

The Government has accepted the Commission's recommendation that Aotearoa New Zealand's climate response should prioritise gross emissions reductions while maintaining support for removals. This review of the NZ ETS will assess what role emissions pricing should play in supporting this objective. If the Government decided the NZ ETS should prioritise gross emissions reductions while maintaining support for removals, this could mean, for example, that the NZ ETS should:

- incentivise the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow to reduce gross emissions.
- incentivise emissions removals to help meet Aotearoa New Zealand's climate change goals, including providing a sink for hard-to-abate emissions in the longer term.

While the NZ ETS would continue to drive emissions removals through forestry, this should not displace nor significantly delay gross emissions reductions. This would mean considering how the design and settings of the NZ ETS could provide the necessary price signal for both emissions reductions and removals.

[13] Climate Change Commission. 2021. *Ināia tonu nei: a low emissions future for Aotearoa.* Wellington: He Pou a Rangi | Climate Change Commission. Recommendation 11.1.

[14] This component of the 2050 target applies to all greenhouse gas emissions, except biogenic methane.

[15] Climate Change Commission. 2021. *Ināia tonu nei: a low emissions future for Aotearoa*. Wellington: He Pou a Rangi | Climate Change Commission. Recommendation 25.2a.

[16] Climate Change Commission. 2023. *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan*. Wellington: He Pou a Rangi | Climate Change Commission. Proposed Recommendations 3 and 15.

THIS DISCUSSION DOCUMENT BUILDS ON PREVIOUS ENGAGEMENT AND CONSULTATIONS

Over the past two years, multiple public consultations have been undertaken relating to the NZ ETS.

Strong and consistent feedback has been received from Māori that more ambitious action on climate change is needed, both for people and the environment. Further feedback has been that exotic forestry in the NZ ETS is important as a financially viable land-use option for Māori land owners and rural communities (as well contributing to our climate goals).

Other feedback relevant to this consultation includes:

- support for incentives for indigenous afforestation and protection of the remaining ngāhere and wetlands
- natural regeneration of indigenous trees needs to be encouraged and rewarded: indigenous regeneration is itself 'the right tree in the right place'.

Submitters often commented on whether the NZ ETS should have a greater focus on gross emissions reductions or removals.

During consultation on proposals for the emissions reduction plan in 2021, the most common theme was the need to reduce gross emissions. Many submitters considered that continuing to include forestry in the NZ ETS would encourage increased forestry (especially exotic forestry), rather than gross emissions reductions. These submitters supported proposals to constrain forestry in the NZ ETS. Other submitters supported the continued use of offsets to buy time before low-emissions technologies become readily available and economical.

During consultation on NZ ETS limits and price control settings in 2022, submitters were divided over where the focus should lie. Just over half supported NZ ETS price controls having a focus on gross emissions reductions, and the remaining submitters supported a focus on net emissions reductions.

Those who favoured a focus on gross emissions reductions highlighted that this would better align with the emissions budgets and NDC, with some noting that relying on emissions removals from forestry is not an effective long-term strategy.

Those who supported a focus on net emissions reductions argued that a focus on gross emissions reductions ignores the fact that some emissions are hard to abate. Such a focus also downplays the time and resource constraints associated with investments in emissions reduction technologies.

As part of the consultation on managing exotic afforestation incentives in the NZ ETS in 2022, submitters were asked whether they agreed that widespread permanent exotic afforestation may make it harder to achieve Aotearoa New Zealand's long-term climate targets. Views were mixed on this issue.

Many agreed that the NZ ETS is unsuitable for meeting Aotearoa New Zealand's climate targets, and a focus is needed on gross emissions reduction rather than removals. They agreed that there is a risk of NZU supply issues in the NZ ETS

– resulting from high levels of permanent afforestation – and that large-scale permanent exotic afforestation might affect the carbon price. Many said that indigenous forests are a more sustainable option for permanent carbon sinks than exotic forests.

Most of those who disagreed stated that permanent exotic afforestation is needed to meet Aotearoa New Zealand's climate change targets until sufficient technology is in place to enable and drive a net-zero-emissions economy and/or because indigenous forests are expensive to establish and maintain and are slow growing.

They also considered that encouraging domestic afforestation is preferable to sourcing carbon credits from overseas, and that government could manage supply issues in other ways (eg, by auctioning fewer NZUs). Māori landowners strongly advocated for this position.

A 2022 consultation canvassed views on a range of options and system elements for pricing agricultural emissions (as developed by He Waka Eke Noa – see Pricing agricultural emissions), with a summary to be released shortly. A major theme was the trade-off between emissions reductions and the economic impact of these reductions on emitters and communities.

RECOMMENDED CONCEPTUAL FRAMEWORK

Theory of Change

A realistic economic transformation strategy needs to be based on a pragmatic theory of change capable of bringing about a shift in direction for the entire economy. Such a theory of change needs to focus on the following core elements:

1. The main drivers of GHG emissions/removals.
2. The elements of society with the most agency to change direction at the pace and scale needed.
3. Actions that are cost-effective (low-hanging fruit) vs actions that are not cost-effective (high fruit).
4. The cost of actions and the source of money capable of bearing this cost.
5. The political expediency of the strategy for change (will it survive elections?).

Agency

A pragmatic theory of change needs to focus on those elements of society with the most agency to change direction at the pace and scale needed. At a small scale one can rely on the voluntary actions of committed, motivated, and capable individuals willing to cover the costs of solutions themselves. But this will not transform the economy. For that we need behaviour change in the majority of the population, particularly among people and organisations who are not motivated to make voluntary short-term sacrifices for the long-term gains associated with reducing climate change risk.

A realistic theory of change at scale needs to ask whether ordinary people and organisations have the power to transform the economy (e.g., through the sum of individual actions), or whether such change can only come about through a focus on the owners and managers of systems in the economy.

Our view is that system change of the scale and pace necessary is possible, but only when focusing the core of a strategy on owners and managers of systems. In this way, ordinary people can go about their daily lives while the system changes around them.

For a transport example, we imagine a future when the only vehicles available for ordinary people and organisations to purchase are electric, together with a nation-wide system of convenient vehicle charging stations with the capacity to cope with demand. We also imagine such a future to include a transformation away from private motor vehicle ownership in cities, where instead there is a combination of:

- Fleets of electric ride-share vehicles.
- Improved urban design around public transport to drive public transport demand.
- Improved public transport services for public transport supply.
- A payment-by-subscription model for access to transport services rather than ownership of transportation assets (for rideshare and public transport services).

Those with the greatest ability and power to control and influence the various systems in our economy include the government, the business community, and the investor community. The government can set policies and regulations, but if these are unpopular the government will lose its mandate (i.e., lose the election). In contrast, the business community and the investor community are not elected and therefore are not directly impacted by voters. Because of this, these communities can choose to divest from dirty development and dirty

technology and reinvest into clean development and clean technology. The government can influence this choice at low electoral risk by working with these communities to design incentive systems and build enabling regulatory environments.

Low and High Fruit

The logic underlying effective carbon markets is the marginal cost of abatement (emission reductions). Here the cost of each additional abatement action tends to increase compared with the last. This is because the low hanging fruit tend to get harvested first (because they are the cheapest), and once they have been harvested are no longer available for harvest. This means that additional abatement actions need to target ever more expensive actions. Here the marginal cost of abatement increases (e.g., per 1tCO2e) as one moves from low fruit, to medium, and then high fruit on the "tree" of abatement.

Figure i. Concept diagram of a marginal abatement cost curve. Source: MFE (2020).

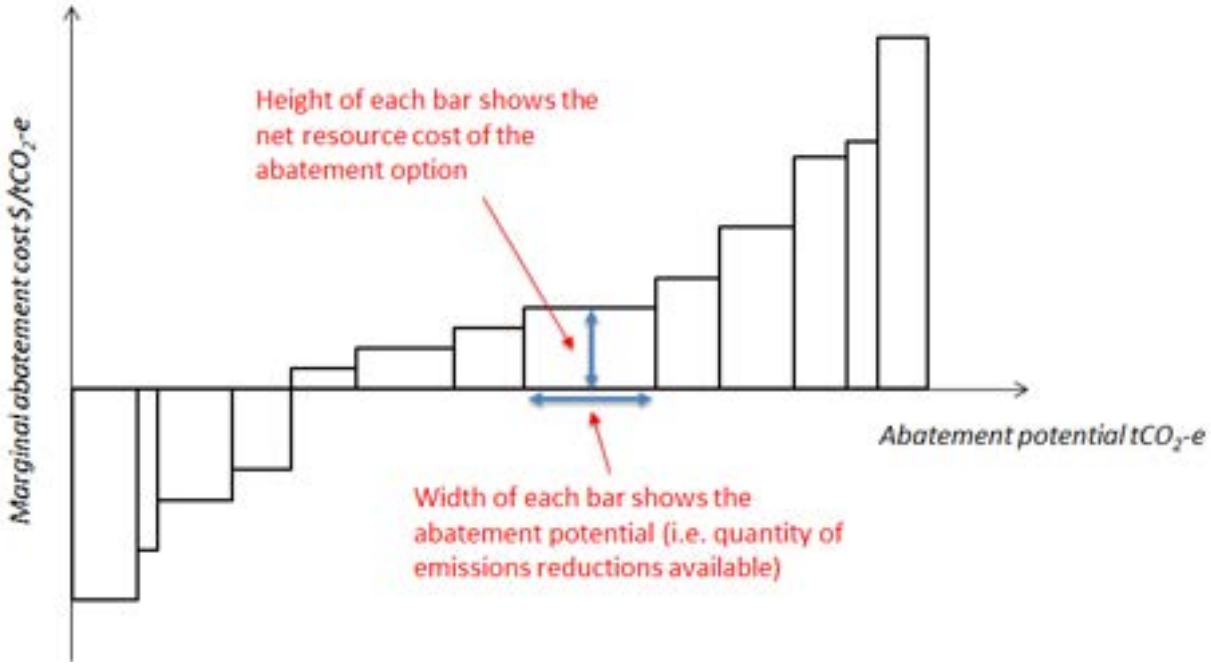
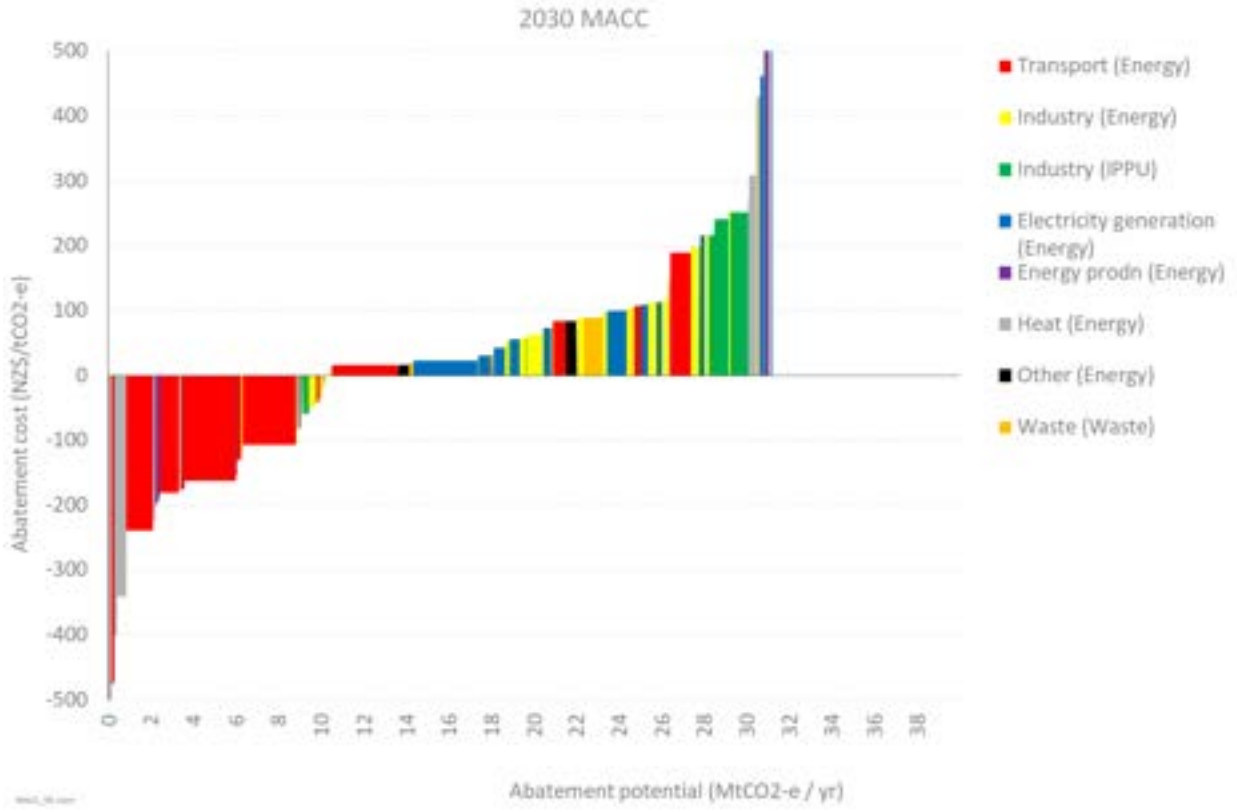


Figure ii. Marginal abatement cost curve for energy and industry sectors in 2030. Source: MFE (2020).



As seen in Figure ii above, some abatement costs are below zero on the cost curve (i.e., are cost negative) on the left-hand side of the graph, whereas other abatement costs are above zero on the right-hand side of the graph.

The two main lenses with which to view the marginal abatement curve are the cost-efficiency lens, and the carbon price and offsetting lens.

Cost Efficiency: Given that the economy and organisations within it have low and medium fruit and given that there are not unlimited funds available for emissions reduction, an efficient emissions reduction strategy (and policy) would pursue these low and then medium fruit first.

Carbon Price & Offsetting: When carbon offsets are available in a carbon financing instrument there is always an option to choose between:

a) Abate in-house (gross abatement).
b) Abate via offsetting (offsetting with no gross abatement).
c) Abate in-house and offsetting (net abatement).

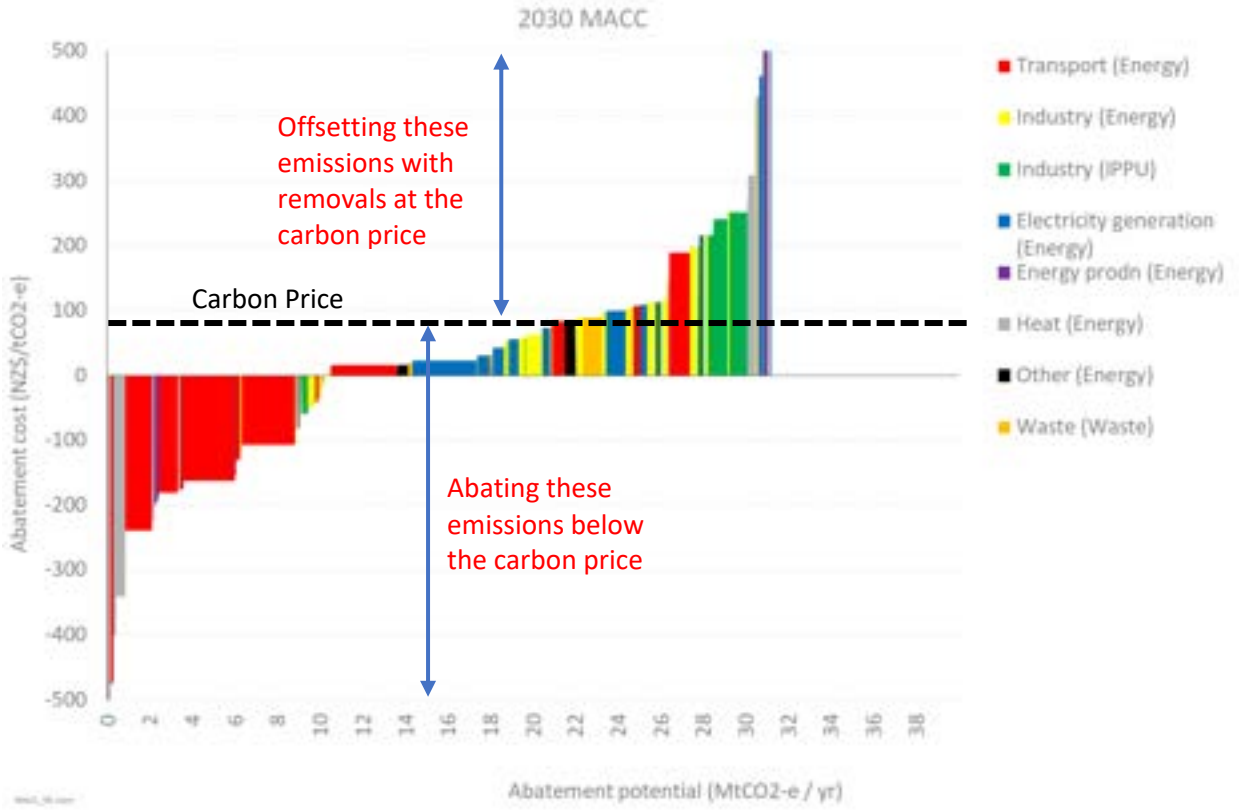
The carbon price (e.g., the cost of carbon credits) and the design of the financing instrument can have an influence on the choice between a), b), or c) above.

The NZETS is designed around option b) above which we disagree with (more on this below). When the carbon price is multiplied by the volume of emissions to abate there is a total cost to for offsetting. If it is cheaper to abate in-house (gross abatement) by harvesting low and medium fruit, then this is the most economically efficient thing to do.

Figure iii shows how the carbon price can interact with the marginal cost of abatement in climate change mitigation policy. Here, many cost-positive in-house abatement options exist that are below the carbon price (i.e., below the cost to offset). Moreover, the total emissions abatement available below the carbon price comprises the majority of emissions in the system (low and medium fruit harvested). This then leaves only the

high fruit on the abatement tree to manage. This is where carbon offsets can sensibly come into the system without compromising ambitious emission reduction targets.

Figure iii. Marginal abatement cost curve for energy and industry sectors in 2030 with hypothetical carbon price of $85 added. Modified from MFE (2020).



The abatement and offsetting model described in Figure iii is a model for a net zero carbon outcome where offsetting is restricted to taking responsibility for emissions that are too expensive to abate in-house. Also, through time investment in clean development and clean technology will either eliminate those emissions above the carbon price or bring their abatement costs down to or below the carbon price. At the same time, if the carbon price is managed to rise year-on-year (e.g., in line with the Treasury shadow carbon prices and the Climate Change Commission recommended carbon price path) then the volume of emissions below the carbon price on the abatement cost curve increases leaving fewer and fewer emissions remaining high on the abatement tree. This also means that less and less carbon emissions need to be offset to deliver a net zero carbon outcome.

It should also be noted that achieving a zero-carbon outcome without offsetting (for the nation and also for most organisations) is impossible. This is because there are many emission types that are either physically impossible to eliminate/reduce or prohibitively expensive to deliver. Furthermore, because humans are not plants, we are obligatory emitters of CO_2 anyway. The key is to bring the economy (and the global community) into balance between emissions from GHG sources and removals by GHG sinks.

The NZETS was designed as a 'net carbon' market mechanism without any specific emission reduction targets for NZETS participant emitters, and removals via offsetting designed to be the norm rather than the exception. For this reason, the elegant dynamic between the marginal cost of abatement, carbon pricing, and removals via offsetting has never been realised in the NZETS. This elegant dynamic is not lost, however, in the Voluntary Carbon Market (more below).

Cost and Source of Money

Avoiding dangerous climate change at the global and domestic level will be very costly. According to the OEDC, delivering the climate compatible UN Sustainable Development Goals (SDGs) will require around US$7 trillion annually. It is a mathematical and financial certainty that the global taxpayer and philanthropist cannot afford this. According to PWC Global the institutional investor community will be managing around $145 trillion annually by 2025. It is a mathematical and financial certainty that the private sector can afford to meet this challenge.

For a local example, reforesting 1 million ha of erosion lands in rural Aotearoa with native forest using government grant funding will cost the taxpayer around $25 billion. Reforesting the same 1 million ha of erosion lands with continuous cover exotic forests using a well-functioning NZETS will cost the taxpayer $0.

A key element in national climate change policy is to identify the most cost-effective solution options and wherever possible reduce the burden on the taxpayer. The nation is already in a cost-of-living crisis and looking towards a recession. It is important to focus climate change policy on market-based financing wherever possible so that taxpayer's funds are reserved for funding activities that cannot be funded by markets. Doing so will avoid situations where perverse trade-offs are necessary, such as paying nurses less to fund expensive climate change policies.

Political Pragmatism

Climate change policy exists in a political economy – not just an economy. In other words, the political dimension will always be an important determinant of the success and durability of climate change policy including the NZETS through the consistent need to gain a public mandate via elections.

The political failure to move the nation on a more deliberate pathway to meeting our Paris Agreement target and avoiding dangerous climate change is a focus on divisive partisanship rather than inclusive nationhood. This failure has been amplified by a failure of the major political parties to recognise, work with, and accommodate the legitimate concerns of their political opponents on climate policy. One example is the polarised debate concerning native forests vs exotic forests in the NZETS.

Instead, we have seen political parties being captured by single interest groups and a resulting populism more focused on playing to a party base in an echo chamber rather than genuine leadership in an emerging climate crisis that puts common taonga at risk – out descendants and their future wellbeing.

A case in point is the way that the NZETS has been used as a political football by different political parties for special interest ends. As a result, there is no sign of carbon price stability in a market-based mechanism that will rely heavily on private investment for it to perform to its potential. Such investors will not commit to a government-controlled sector whose prices are being mismanaged by the government. One of the fundamental benefits of a government-controlled market (which the NZETS – i.e., it is not a free market), is the ability to stabilise prices and thereby stimulate private investment. But successive governments have failed to capture this opportunity and as a result the NZU price has tracked like the flight path of the pīwakawaka (fantail) up and down, here and there.

What is needed now is genuine leadership capable of uniting the nation behind a common response to a common threat. Such leadership needs to be inclusive, ambitious, realistic, and visionary. This inclusiveness needs to be reflected in a cross-party foundation for policy stability for coming years and decades. This foundation needs to focus common denominators and compromise, rather than single interests and purism.

Such common denominators need to include a focus on an affordable climate change policy, delivered at least cost to society, and that draws out a common purpose from within the existing values of different political groups. A visionary approach to climate change policy will need to include a sense of hope for a common future for all groups in society. Because certain sacrifices will need to be made, it is fundamental that such sacrifices be equitably shared across all groups in society and sectors of the economy.

The industrial revolution in the 18th and 19th centuries succeeded because there was an alignment of purpose and function between government, investors, inventors, and entrepreneurs. Avoiding dangerous climate

change will require another industrial revolution – one that delivers a low-emissions, climate resilient, biodiverse, socially and culturally sustainable economy. This will require a similar alignment of purpose and function, and it is up to the government to take responsibility to help mobilise the private sector into action so that ambitious climate action can survive elections, because it does not rely on government, but instead arises out of a partnership between government and the private sector.

Carbon Pricing

Carbon pricing is a mechanism to drive behaviour change across an entire economy. Such pricing will only drive the desired change if the price is high enough to function as a meaningful price signal for the target sector, and stable enough for that sector to incorporate this price into their business models.

Energy is Price Inelastic

One fundamental problem we feel has not been adequately grappled with is the fact that emissions pricing can only produce behaviour-change in relation to the use of fossil fuel-based energy to the extent that different groups in society are exposed and responsive to carbon price signals. Fossil fuel use in some sectors has proven not to be very responsive to price signals – i.e., these sectors are 'price inelastic'.

This means that when the price of fossil energy rises, individuals and firms in the short term have limited options to respond and mostly tend to just pay the higher price rather than reduce demand or transition to alternatives. In this situation, the cost of energy rises (raising the cost of living to households/consumers) but this does not translate into emissions reduction behaviour change upstream in the energy system (e.g., energy and transport service suppliers).

There is, however, a relevant sector that is likely to be responsive to carbon price signals in general terms. This is the institutional investor community that provides investment to the energy and transportation sectors. Investors motivated by returns on their investment can move their money from dirty technology to clean technology in response to a carbon price that lowers the profitability of dirty technology. But this only works if the carbon price impacts on the profitability of the underlying investment in an NZETS participant. This profitability is, in turn, influenced by whether the company can pass on this cost to their customers. If they can pass this cost onto their customers, then the price signal is also passed to the customers. The price signal will impact on their customers only if these customers have alternative low carbon options to choose from. If these choices are limited then these customers will just pay higher prices without behaviour change.

Carbon Price Dilution

NZETS participants include obligatory carbon buyers such as big energy, industrial processing, and airline companies. When a carbon price is passed from an NZETS participant downstream to their customers, the carbon price gets embedded into those downstream goods and services. An example would be adding the carbon price to fuel prices at the pump and electricity prices at the household appliance. This action, however, has the effect of diluting the carbon price signal by distributing it to a large number of consumers with few alternatives to choose from.

When the carbon price is distributed among a very large number of downstream consumers the impact of the carbon price is diluted to homeopathic concentrations and shared by a large group. Carbon price homeopathy might cause behaviour change in sectors that are responsive/sensitive to carbon prices. But the energy and transport sectors are price inelastic. Because of this, these very low concentrations of distributed carbon prices will just get absorbed by indifferent consumers rather than incentivising behaviour change.

How does this impact on profitability for investors in the energy and transport sectors? Very little. So, do these price elastic investors shift their money as a result of the carbon price signal? No. What then, is the overall economy-wide effect? Higher fuel and transport prices with little or no meaningful behaviour change caused by this economic instrument.

Accordingly, we find it unsurprising that the nation is not on track to meet its emission reduction goals. It is also unsurprising that the government's policy framework has instead relied much too heavily on removals by forest sinks to compensate for the failure to reduce emissions from sources.

The NZETS then functions predominantly as a "tax" to increase prices and add to the cost of living for consumers at reduced benefit in aggregate to consumers for paying this "tax". Moreover, this "tax" is collected by demand-side NZETS participants and allocated to the forest industry suppliers of carbon credits. As a result, plantation forestry has attracted lots of investors wanting to capitalise on the opportunity. In turn, this is increasing competition for access to rural land and driving up rural land prices, together with whole farm conversions plantation forestry. This situation is causing controversy principally because scaling up is working in the plantation forest industry due to the enabling conditions for investment created by the current design of the NZETS.

A middle path is sought where investment can be directed to participants that need it the most (e.g., Māori communities struggling to build an economic foundation for their people) and landscapes that need it the most (erosion-prone landscapes).

Stimulating Investment

This situation demonstrates that when you mobilise the investor community through price incentives, money moves at scale and entire sectors of the economy transform. But the equivalent transformation is not happening in clean technology and clean development at the scale and pace needed. To mobilise a transformation in clean development and clean technology, enabling investment conditions need to be established. A key role of government is to create these enabling conditions. This can be delivered by means of complementary government interventions:

1. Increase the attractiveness of investments in clean technology and clean development.
2. Decrease the attractiveness of investments in dirty technology and dirty development.

The NZETS can be tuned/redesigned to deliver this combination through a mechanism whereby:

- Investments in dirty development and dirty technology are exposed to the carbon price signal.
- Investments in clean development and clean technology will not be exposed to the carbon price signal and enjoy a profitability advantage.
- Financial risk associated with clean development and clean technology is reduced through a variety of government interventions including (but not limited to):
    - Underwriting/socialising financial risk.
    - Government keystone investments.
    - Government financing at a low cost of capital.
    - Reducing compliance costs.
- Financial risk associated with dirty development and dirty technology can be increased through:
    - Exposure to carbon prices (already covered above).
    - Reducing access to financial risk mitigation by government (removing any kind of subsidy or policy stimulant).
    - Increasing compliance costs.

Such measures will work in two ways:

1. It will contribute directly to a shift in investment behaviour towards clean development and clean technology.
2. It will send a signal to the broader investment community that the time has come to divest from dirty development and reinvest in clean development.

Investment signals can mobilise investment sectors not covered by direct investment support. This can include influencing the behaviour of non-NZETS participants and their investors. It is worth recalling that the vast majority of businesses and organisations in the economy are not participants in the NZETS. Because of this,

government policy needs to be compatible with stimulating behaviour change in this community through a combination of indirect investment signals, regulations and compliance costs, and direct incentives (more on voluntary action by non-NZETS participants below in the section on the Voluntary Carbon Market).

In summary, the key conditions required to stimulate a sea-change in the investment community towards clean development and clean technology include:

- Reducing investment risk in desirable sectors and activities to stimulate investment in low carbon development and associated technologies.
- Increasing investment risk in undesirable sectors.
- Keeping regulatory goal posts in the same place.
- Pricing carbon emissions high enough to function as a genuine price signal to the investment community and priced at least in alignment with the social cost of those emissions. Treasury has estimated the social cost of carbon emissions, and the Climate Change Commission has developed a recommended carbon price path capable of creating the necessary price signals.
- Supporting carbon intensive sectors to transition towards low carbon futures.

* * *

The picture painted above is about the mainstream of the NZETS and its impact on Aotearoa. It does not mention the positive things that are happening on the margins of a carbon price in the economy. There have been marginal improvements in energy efficiency and low carbon investments. There have also been marginal improvements in sustainable land management from native reforestation and partnerships with rural landowners for continuous cover forestry. But these marginal gains are being delivered in the face of strong headwinds from a policy environment that remains predominantly unfavourable to these actions.

The point is to enable these activities to operate at scale. Scale means transformation of entire sectors of the economy and currently the only transformations taking place are delivering perverse outcomes (scaling up of the plantation forestry sector to the discomfort of rural communities and farming).

Chapter 2: Expected impact of current NZ ETS

The NZ ETS currently treats emissions reductions and removals the same: 1 tonne of emissions reductions is equivalent to 1 tonne of emissions removals. We disagree that emissions reductions and removals are treated the same in the NZETS. Emission reductions are not significantly incentivised, whereas emission removals are. The revenue from NZU sales goes to the forest industry and this enhances profitability in this sector, thereby stimulating investment in this sector. The same level of investor stimulation is not delivered to emission reductions.

Because reductions and removals have the same incentives, the NZ ETS drives investment in the lowest-cost source of abatement first. More costly abatement is incentivised over time as the NZU price increases. Reductions and removals do not have the same incentives. This is because energy investors are predominantly insulated from the negative impacts of the carbon price on their investments in dirty technology. In contrast, investors in the forest sector enjoy enhanced profitability in the plantation forestry sector and this has driven significant land use change as a result.

The NZ ETS cannot influence specific volumes or forms of emissions reductions and removals because it does not have levers to drive different types of abatement. This means the government cannot drive faster and greater gross emissions reductions through the NZ ETS. This signals that the NZETS needs to be redesigned to remedy this.

WHAT ARE THE LIKELY EMISSIONS REDUCTIONS AND REMOVAL OUTCOMES OF THE NZ ETS?

The NZ ETS is expected to drive large-scale exotic afforestation to reduce net emissions

Participants in the NZ ETS will choose the cheaper of reducing their emissions or buying NZUs. But emitters can pass the cost of their NZU purchases onto their customers, so not only is this cheaper it is dramatically more cost effective. This is why the carbon price is not functioning as an incentive to emitters to emit less. To change this dynamic the NZETS needs to be redesigned to expose the profitability of the emitters to the carbon price where they cannot just pass this onto their customers. This will drive investment in innovation and behaviour change among the emitters upstream in the system. It is expected that the extent of emissions reductions will be shaped by the expected short- and long-term costs of purchasing NZUs.[17]

Forestry (particularly exotic forestry) is currently one of the lowest-cost and scalable sources of abatement. High current and expected NZU prices are resulting in significant exotic afforestation; a trend that is forecast to continue in the medium term. However, the NZ ETS will likely drive far lower levels of indigenous afforestation over the same period. This is because indigenous forests earn NZUs more slowly than some exotic forests (because most indigenous species tend to grow more slowly than exotic species) and have higher establishment costs.

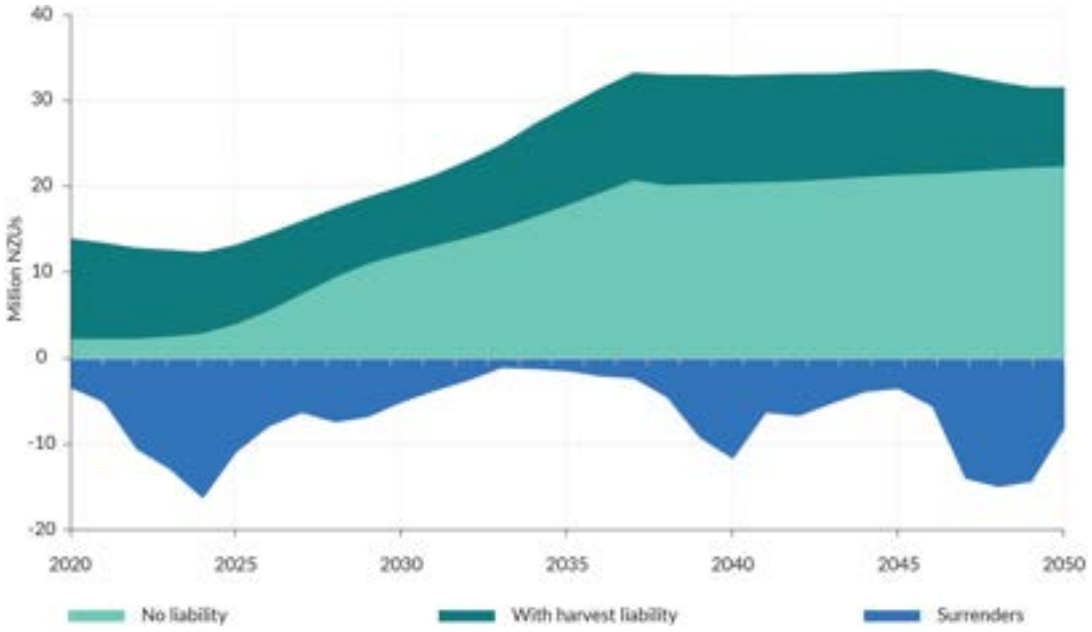
[17] For example, if it costs $150 per tonne of emissions for an industrial manufacturer to apply a new low-carbon technology, but the expected long-term cost of NZUs is $100, the manufacturer would be expected to purchase NZUs, rather than reducing their gross emissions.

[18] Manley B. 2022. *Afforestation and Deforestation Intentions Survey 2021: Final Report*. MPI Technical Paper No: 2022/19. Prepared for the Ministry for Primary Industries by the University of Canterbury.

[19] Respondents comprised: (1) large-scale forest owners – generally owners with more than 10,000 hectares of forest, (2) forestry consultants and managers, and (3) other individuals or organisations identified as undertaking afforestation.

The Ministry for Primary Industries (MPI) has developed projections of future forestry allocations and surrenders of NZUs from a survey of afforestation and deforestation intentions (figure 3).[18] These projections reflect the price expectations of respondents[19] at the time of the survey (November–December 2021, with some follow up in early 2022). MPI has also used statistical analysis of actual planting rates in response to NZU, land and commodity prices. The forest industry intentions survey had very specific caveats and disclaimers that have been somewhat ignored by the government.

Figure 3: Projected forestry allocations and surrenders to the New Zealand Emissions Trading Scheme



Note: This figure shows the central MPI projection, which estimates an additional 38,000 hectares of new afforestation on average over the long run. The light green area is the estimated number of NZUs from forestry to be potentially available to the market that can be traded. But the forest industry believes this to be a significant over-estimation by projecting short-term data collected by Manley into the long-term. As such, the area under this part of the graph remains highly contested. These are largely from new forests either on averaging accounting or in the permanent forests category. The dark green area represents NZUs held by existing forestry participants to meet future harvest obligations. It is generally not expected these NZUs would be supplied to the market. The blue area shows the forecast volume of NZUs forestry participants will be required to surrender for future harvests.

At present, NZUs credited to forests are a small proportion of the overall supply of units available to the NZ ETS market. However, this proportion is expected to increase over time (as shown in figure 3) due to new forest registrations in the NZ ETS.

The NZ ETS may play a limited role in reducing gross emissions and decarbonising the economy

Opportunities to reduce gross emissions tend to have higher costs than emissions removals from exotic forestry. Gross emissions reductions can also be capital intensive, require specialised investments, and be less responsive to carbon pricing. This suggests that, to drive gross emissions reductions, we need higher NZU prices, as well as policies that address market barriers and failures.

A new design of the NZETS first needs to amplify the impact of the current carbon price by measures such as:

- Requiring emission reduction targets for demand-side NZETS participants (individually or in aggregate), and/or
- Other measures that reduce the ability of demand-side participants to pass the carbon price onto their

customers in a process of carbon price dilution.

At current NZU prices, it is likely that the NZ ETS is incentivising some gross reductions. For example, there is evidence that Aotearoa New Zealand's carbon price is playing an important role in encouraging the development of renewable electricity generation.[20]

[20] Concept Consulting. 2022. *Which way is forward? Analysis of key choices for New Zealand's energy sector*. Wellington: Concept Consulting

In recent NZ ETS consultations, some participants have told us that higher prices over the past few years are influencing investment decisions but barriers exist that make it harder to reduce emissions.[21]

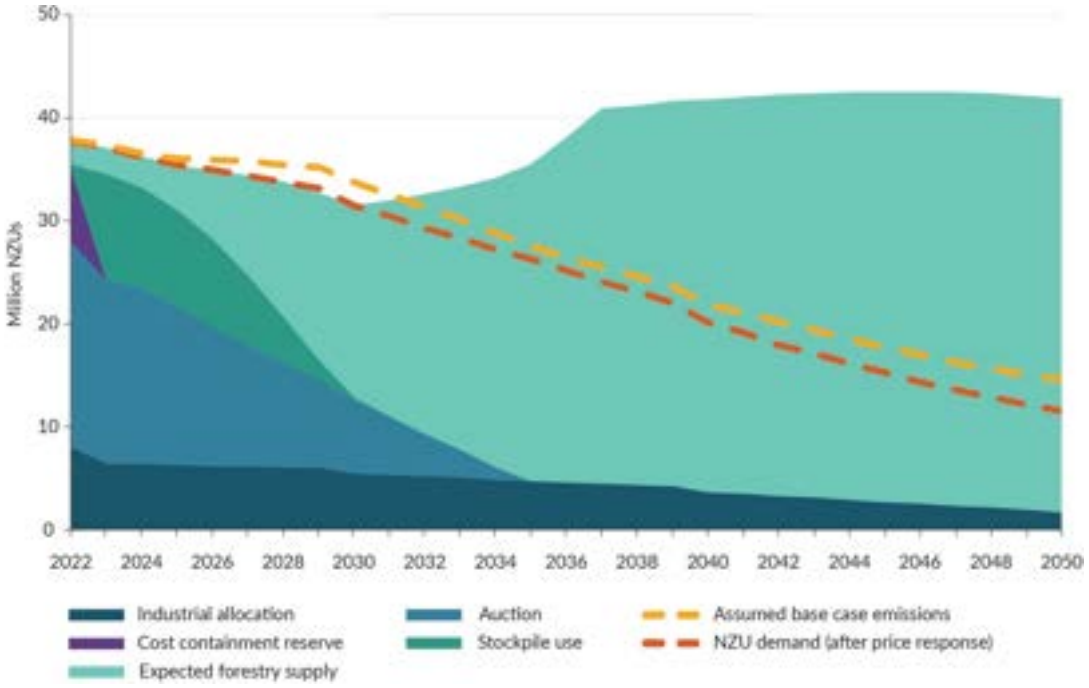
In *Ināia tonu nei*, the Commission identified the risk of exotic forestry in the NZ ETS displacing and delaying gross emissions reductions in the future. The predicted high supply of forestry removals could allow emitters to meet all or most of their NZ ETS obligations at relatively low cost, avoiding more expensive emissions reductions. The large projected supply of low-cost forestry removal units, as described in figure 3, could dampen NZU prices, over the medium to long term, to levels below prices needed to drive significant gross emissions reductions.

Both gross reductions and removals are required to support our transition to a low-emissions economy. Chapter 3 considers the implications of delaying decarbonisation in Aotearoa and describes the case to prioritise gross reductions in the NZ ETS.

EXPECTED MARKET DYNAMICS

The government's modelling suggests that, under current NZ ETS settings, the total supply of NZUs could exceed the demand for units from participants with surrender obligations in the NZ ETS (figure 4) from the early 2030s. This graph carries the same contested assumptions as Figure 3.

Figure 4: Forecast New Zealand Unit supply and demand in the New Zealand Emissions Trading Scheme



Note: This figure includes the total supply of NZUs from different sources, including forestry, government auctions, industrial allocation, and the stockpile. The assumed base case emissions indicate the forecast demand for NZUs from emitters in the NZ ETS required to meet future surrender obligations.

[21] Ministry for the Environment. 2022. *Proposed changes to New Zealand Emissions Trading Scheme limits and price control settings for units 2022: Summary of submissions*. Wellington: Ministry for the Environment.

Regardless of NZ ETS settings, demand for NZUs is forecast to gradually fall over time, largely due to the shift to electric vehicles, which will reduce transport emissions. These projected business as usual reductions are far smaller than those proposed in the emissions reduction plan for the transport, energy and industry, and waste sector sub-targets. The Government intends to reduce the supply of NZUs from auctioning and industrial allocation over time, to help achieve increasingly ambitious emissions budgets in the future.

The total supply of NZUs from removals, however, is forecast to increase over the same period. If NZU prices remain at current levels, the resulting exotic afforestation would result in the supply of NZUs from forests exceeding NZU demand. When this occurs, prices are likely to fall.

For prices to be maintained, NZUs from forests would need to be added to the existing stockpile, which would need to continue to grow and reach enormous levels for these prices to be maintained.

This supply–demand dynamic is highly unlikely to be sustainable. It is far more likely the market price of NZUs will settle at a lower level, at which total supply would be sufficient to just meet demand over the long run (figure 5). The government's modelling therefore suggests NZU prices would fall, as shown in figure 6. The government can control the carbon price if it wants to and has done so throughout the history of the NZETS.

Figure 5: Total supply and demand with falling price

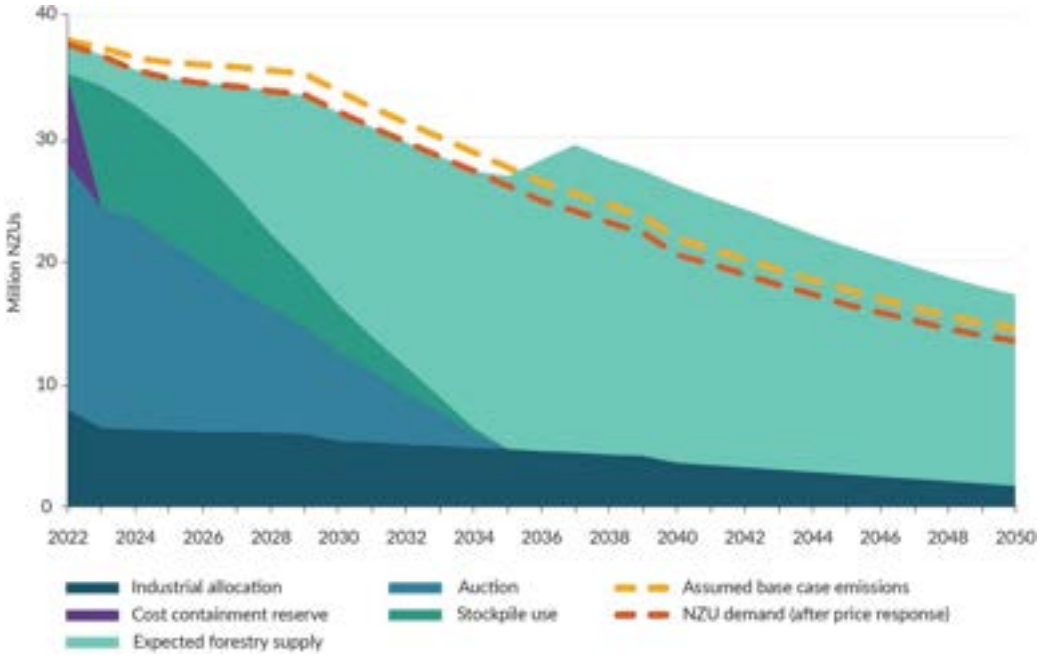
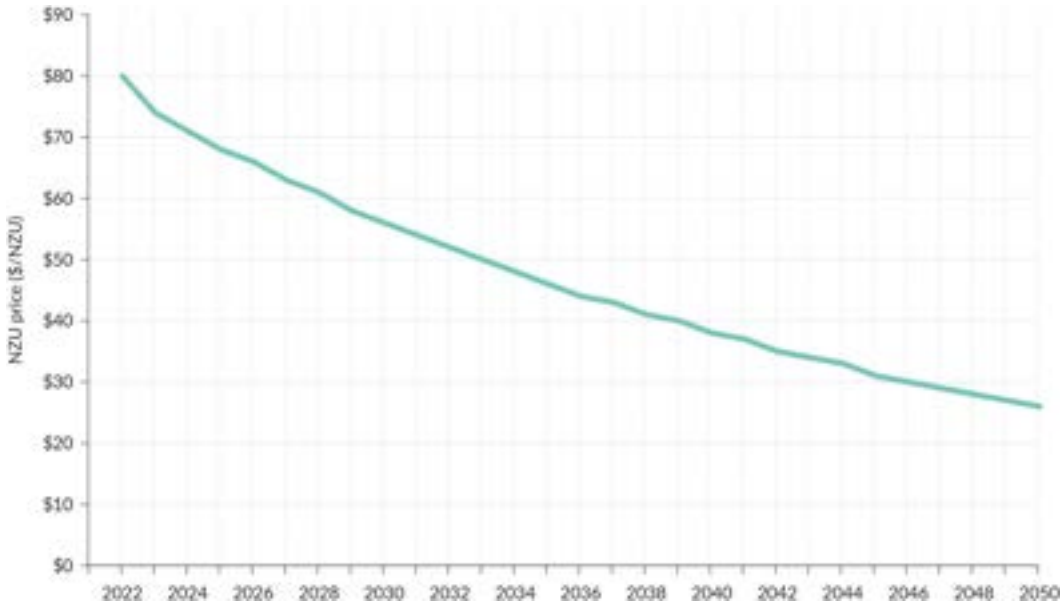


Figure 6: Modelled New Zealand Emissions Trading Scheme price path



Because the government has the ability to influence the carbon price, we recommend that the objective of government carbon price management under the NZETS is the alignment of the carbon priced to the Climate Change Commission price path and the Treasury Shadow Emission Prices. Ultimately the carbon price needs to align with the social cost of carbon to society – otherwise the price signal bears no relation to the external cost of GHG emissions.

The modelled price pathway indicates how the NZ ETS market could respond to forecast unit supply and demand dynamics. We note that current NZU market prices are lower than presented in figure 6 and expect this response would be quite different if the proposals set out in this discussion document were implemented. The response would also be different if other changes are made to the NZ ETS through parallel government work programmes, such as the redesign of the permanent forestry category.

This modelled price path is not a prediction of future NZU prices. All modelling is inherently uncertain and depends on a range of assumptions, particularly on the expected response to prices by emissions sources and removals. The modelling uses projections of future NZU supply and demand, which are themselves uncertain. Some stakeholders have suggested that NZU pricing and afforestation trends will not play out like this. Reasons cited include that land-use change is affected by other regulatory and societal changes, and consumer demand may lead to markets pricing in carbon and driving reductions.

However, even when different assumptions are used, the analysis suggests that current market settings are likely to lead to NZU supply exceeding demand from emitters, leading to falling NZU prices. This is also dependent on contested assumptions relating to the Manley report on forest sector planting intentions. This conclusion is supported by other recent government analysis, providing reasonable confidence that the current NZ ETS design will lead to falling prices.[22]

The NZ ETS will not be able to maintain a strong and stable emissions price

If the modelled supply and demand dynamics become a reality, this will have a significant impact on the NZ ETS. In particular, these dynamics would undermine the ability of the NZ ETS to maintain a strong and stable emissions price that drives gross emissions reductions and incentivises removals.

[22] Ministry for Primary Industries. 2022. *Managing Permanent Exotic Afforestation Incentives Regulatory Impact Statement*. Wellington: Ministry for Primary Industries.

More specifically, falling or uncertain prices could:

- increase uncertainty over the effects of price controls: the NZ ETS price floor and ceiling operate through the NZ ETS auctioning system. Increased uncertainty will occur over whether the price floor or the confidential reserve price will be reached. This could result in future auctions not clearing, which would have implications for the supply of NZUs in the market[23]
- reduce auction revenue: falling prices would also affect government revenue from NZU auctioning, which is currently used to fund other climate policies through the Climate Emergency Respond Fund. However, this would not limit the government from using other funding mechanisms to support climate action.

[23] The March 2023 NZ ETS auction was declined and no NZUs were sold. Some market commentators have suggested uncertainty regarding future NZU market prices may have contributed to this result.

IMPACTS OF EXOTIC AFFORESTATION

Because it grows and absorbs carbon quickly, exotic forestry is an important part of our climate response, as well as a source of income and employment in our communities. Aotearoa will not be able to achieve either its NDCs or domestic emissions targets without some additional exotic afforestation. Well-managed exotic forestry can also support other environmental outcomes, such as stabilising erosion-prone land.

However, the Government recognises that challenges are associated with exotic afforestation, which will need to be carefully managed in the future. Key challenges are set out in table 2.

Table 2: Key challenges of exotic afforestation

Land-use change	• Converting land to forestry could have a range of impacts, particularly where converted from other productive uses (such as beef and sheep farming).
	• Widespread land-use change could have impacts on:
	  ○ employment: while not always the case, unmanaged permanent forestry can involve fewer jobs and has flow-on effects for rural communities.
	  ○ exports: unmanaged permanent forestry generates fewer exports than other land uses.
	  ○ the environment: unmanaged forests, particularly permanent exotic forests, may also have environmental issues associated with them (eg, fire, disease, wilding pines), which must be balanced against the environmental benefits forestry can provide (eg, erosion reduction, improving soil conservation, flood regulation, and water quality).
	  ○ economic use of land: the ability to generate returns for land that may otherwise be unproductive (eg, through earning NZUs).

Land-use flexibility	• Relying on forestry to achieve our climate change goals (including our emissions budgets and domestic 2050 target, as well as our NDCs) means that, once land is forested, it needs to remain forested. Converting land to permanent forestry therefore reduces the flexibility of land uses.

Permanence	• The permanence of carbon stored in forests is a further challenge. Forests are vulnerable to fire, strong winds, storms, droughts, and pests and pathogens, and these risks are being exacerbated by climate change. If destroyed, the carbon the forest has stored will be returned to the atmosphere. • Ensuring that removals are permanent requires ongoing management, monitoring and enforcement to make sure trees lost to adverse events are replanted.

The Government has a 'right tree, right place, right purpose' strategy for forestry that is designed to address these challenges.

The types of forestry, their location and management are also being considered in other workstreams. For example:

- changes to the National Environmental Standards for Plantation Forestry
- proposed changes to the permanent forest category in the NZ ETS, which is currently out for consultation.

This review will consider the scale of forestry removals driven by the NZ ETS.

Maximising climate change resilience co-benefits of the NZETS.

The country desperately needs to build climate resilient landscapes in erosion-prone parts of NZ requiring a movement away from both pastoralism and clear-cut plantation forestry in sensitive regions (e.g., Tairawhiti, Hawkes Bay, Whanganui District, Ruapehu District, Northland, Tasman District). This amounts to the need to replace existing land use with permanent forests for around 1 million hectares of land.

This will require replacing clear-cut forestry and pastoral farming on hundreds of thousands of hectares of erosion lands with an economically viable alternative. The most practical alternative that will not crash rural land value is continuous cover forestry.

Continuous cover forestry never clear cuts the forest but instead either does not harvest, or harvests individual trees, groups of trees, patches or strips in an on-going cycle of harvest and replacement. This approach is common in other countries including federal forests in the US, many developing countries, and around 30% of all forestry in Europe. Lands too steep for any harvesting can be planted in native trees and managed for conservation.

A well designed NZETS can fund this kind of sustainable forestry at no cost to the taxpayer – a much needed attribute of a national climate change response strategy. The government could redesign the NZETS to direct forest carbon sector investments into permanent reforestation into the targeted geographies where an economically viable alternative to pastoralism or clear-cut forestry is needed. This could be delivered by:

a) Restricting averaging accounting NZETS projects to lands capable of supporting clear-cut forest management without causing predictable sediment trespass to downslope and downstream landowners and infrastructure.

b) Allowing permanent forest carbon projects to target erosion-prone areas.

The gold-plated version of permanent forest in the NZETS is native forest. But as already stated by government, and as understood intimately by our networks, the slow growth rates of native forests mean that the financial viability of carbon-financed native reforestation is limited currently to either natural regeneration, or native plantings that are supported by other sources of finance (e.g., grant funding, cross subsidies from exotic reforestation areas in the same business model).

Our own work has shown that 100,000 ha of natural regeneration using a "shut the gate" approach and starting in 2024 would contribute zero carbon sequestration towards the 2030 Paris Agreement target, cost $650 million in investment (assuming no land purchase costs), and not be financially viable (i.e., unlikely to gain access to investment capital and not be financially self-sustaining). Indigenous afforestation of 100,000 ha planting 2,000 stems/ha would deliver approximately 800,000 carbon credits towards the Paris Agreement target, require $1.5 billion in investment and also not be financially viable (and not gain access to capital). In contrast, a project that used exotic afforestation managed as continuous cover forestry (including a transition to indigenous forests over 60 years) would deliver between 2.77 million and 3.5 million tCO_2e by 2030 (respectively), is financially viable, and could therefore be delivered at no cost to the taxpayer. Source: Weaver S.A. 2023. Carbon economics of natural regeneration at scale. NZ Journal of Forestry, vol 67 (4).

To get ready for climate change impacts from ex tropical cyclones, the Hawke's Bay Regional Council has indicated that between 200,000 and 300,000 ha of erosion prone pasture needs to be reforested into permanent forest. Our analysis has shown that 200,000 ha of indigenous reforestation would require an investment of $3.2 billion, a starting carbon price of $170 and a total subsidy (capital grant plus carbon price subsidy) of $5 billion. In contrast continuous cover exotic forestry transitioning to indigenous forest over a 60-year period would require investment of $1.1 billion, a starting carbon price of $78, and require a taxpayer subsidy of $0.

Source: Weaver S.A. 2022. Investment barriers to indigenous forest climate solutions. NZ Journal of Forestry, vol 67 (1).

The other important policy consideration of an indigenous forest solution to building climate resilient landscapes is the impact on rural land prices. Because the indigenous reforestation and permanent protection path does not lead to economically productive land use, this option would crash rural land prices for participating landowners. In turn, this would deliver economic hardship to rural communities. If instead the government purchased target lands for the purpose of indigenous forest establishment, the cost to the taxpayer would be massive, it would depopulate many rural areas, and require huge sums of additional public money for pest control over these vast areas.

In contrast, a continuous cover forestry pathway can fund the solution, including on-going pest control, all at a very low cost to the taxpayer.

The nation cannot afford a gold-plated climate change solution – it needs an affordable one. In a climate crisis the perfect is the enemy of the good, and the nation desperately needs 'good' at scale.

As such, the government needs to abandon its plans to ban the use of exotic species in the permanent category of the NZETS, and instead work closely with the forest industry to design and deliver a framework for continuous cover forestry for this NZETS category. This should include forest management requirements to prevent "plant and leave" approaches that have plagued the permanent forest category thus far. We note however, that it was the government that designed the permanent forest category of the NZETS without any management requirements, and as such the government is responsible for the perverse outcomes it blames on the private sector.

CONSULTATION QUESTIONS

Chapter 2 Consultation questions	
2.1	Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?
2.2	Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?
2.3	Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?
2.4	Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

Only partly. The government projections of forest industry planting we believe is significantly over estimated.

2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

We understand from those in our networks that gross emitter behaviour is changing rapidly among participants in the voluntary carbon market. These participants are motivated to reduce emissions because they are motivated to achieve a certification mark to deliver a social licence to operate and to compete in the market more successfully. This is an example of where incentives to reduce emissions is working in a voluntary capacity. We do not have evidence from the NZETS participants.

The key point being that genuine economic incentives work, but the current design of the NZETS is not working in terms of incentivising NZETS participants to reduce gross emissions. This is due to their insulation from the impacts of the carbon price due to their ability to pass these costs onto their customers.

2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

We understand from those in our networks that the carbon price incentive is stimulating investment in plantation forestry at scale. This demonstrates that economic incentives work and why we implore the government to make economic incentives also work in the gross emissions reduction sector when they currently are not working well.

We also understand from those in our networks that carbon price incentives are not sufficient to stimulate investment in indigenous reforestation due to the high cost and lack of financial viability of this activity type.

Carbon price incentives are working for continuous cover forestry and transition forestry but continual government policy changes, carbon price changes, and threats to ban exotics from the permanent category of the NZETS are hampering progress in this sector, particularly among impact focused enterprises trying to maximise indigenous reforestation as part of the continuous cover forestry approach.

2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

No. We believe that the planting intentions modelling of the government is not consistent with the caveats provided by Manley in his research and have over-estimated planting intentions for exotic afforestation.

We also point out that the government framing of exotic afforestation does not take into account the beneficial option of continuous cover forestry for the permanent category of the NZETS, and the way that this type of forestry encompasses a major potential solution to the permanent reforestation of erosion-prone lands.

We also note that pastoralism and clear-cut exotic forestry on erosion-prone lands are only financially viable if these activities do not count the substantial external costs of sediment trespass on downstream and downslope property, infrastructure, and amenities. As a result, rural land prices in such erosion-prone areas do not reflect the true productive capacity of the land, which is lower than current prices when taking these external costs into account.

Chapter 3: Driving gross emissions reductions through the NZ ETS

Chapter 2 showed that the current design of the NZ ETS is unlikely to drive material gross emissions reductions. Instead, Aotearoa will rely on removals (particularly from exotic forestry) to meet its domestic and international climate change goals.

This chapter considers the reasons for prioritising gross emissions reductions in the NZ ETS, while maintaining incentives for the removals. These reasons are informed by the Commission's modelling and analysis. However, much of the empirical evidence showing the costs and benefits to reduce gross emissions in Aotearoa is still being developed. More evidence will emerge over time, as the NZ ETS and other climate policies have an effect.

CUTTING OUR GROSS EMISSIONS NOW WILL...

...decrease cumulative emissions

Because it takes time for low carbon technologies to replace high emissions technologies and low carbon infrastructure to be built, gross emissions reductions are expected to accumulate gradually. The Commission found that even short delays in acting to reduce gross emissions could result in increasing larger shortfalls in future emissions budgets, because the impacts of the delay accumulate. Prioritising actions that reduce gross emissions would result in greater levels of reductions occurring within future emissions budgets, putting Aotearoa on a safer path to meet future climate targets.

...save costs in the longer term

Increasing the speed at which we decarbonise is likely to save costs in the long run. For example, the Commission has found that significant savings could come from fuel switching in:

- transport: the costs of new electrical vehicles, investment in electricity supply and distribution, and charging infrastructure could be more than offset by savings in petrol and diesel use, along with lower maintenance costs.
- space and water heating: savings could also be achieved by replacing fossil fuelled space- and water-heating systems with electricity. The high one-off costs of switching will eventually be offset by savings from running the cheaper electric heating system. We also note that heating household water with grid connected electricity is incompatible with the need to use electricity to fuel cars and other forms of space and water heating (e.g., industrial). Solar water heating and solar photovoltaic electricity generation should become the norm for households. This will take pressure off the national grid and enable it to meet increasing demand for electricity as industrial and transport fossil fuels transition to electricity.
- process heat: savings could be made in electrifying process heat, although it may take longer to realise than space and water heating.

For businesses, households and individuals, fuel switching is likely to result in lower transport costs and heating bills. Industries that currently rely on fossil fuels are also likely to save costs by electrifying process heat.

Several barriers prevent these changes happening now. These barriers, which include uncertainty over future emissions prices and the way that price will change with infrastructure investments, can make it harder for individuals and businesses to identify the best choice in terms of medium- and long-term costs.

Delaying some investments that reduce gross emissions could result in greater economic costs in the future. Some costs may just be pushed out into the future. For example, the costs of replacing fossil fuel boilers with either electric or biomass boilers are unlikely to significantly decrease, given they are based on existing technology that is unlikely to come down in cost.

The Commission's analysis only assessed savings from fuel switching. It did not consider the possible savings from energy-efficiency improvements, mode shifts (such as greater use of forms of transport other than cars), and reduced travel demand, all of which could increase cost savings if they are decarbonised now.

We need carbon price stability at prices aligned to the social cost of GHG pollution. We also need incentives for investment in clean technology and clean development combined with disincentives for investments in dirty technology and dirty development. The NZETS needs to be redesigned to be compatible with these key requirements to enable a transformation of the economy into a low carbon economy.

...help to sustain net zero beyond 2050

In its demonstration pathway, the Commission assumed around 0.6 million hectares of new exotic afforestation between 2022 and 2050. The latest projected rates of afforestation suggest that, if sustained, this level would be reached in the 2030s.[24]

High levels of forestry removals could allow Aotearoa to meet the 2050 target with minimal gross reductions. However, after 2050, there will still be significant residual emissions, and additional reductions and removals will be needed to maintain net zero. The Commission's modelling found that net emissions would increase from 2065 if high rates of afforestation were not sustained, and the amount of carbon stored in forests reaches its long-term maximum.

One way to use forestry removals and enable permanent reforestation to cause significant co-benefits for rural climate resilience is to redesign the NZETS to direct the permanent forest category towards erosion-prone lands and marginal lands.

If our transition locks in a requirement for a high rate of exotic afforestation on an ongoing basis, more land will need to be converted. Although land is plentiful at a national level, this scale of land-use change may risk the social licence of the forestry sector. It would also reduce land-use flexibility for future generations, because already forested land will need to be kept in forest to maintain net zero.

This can be managed through steering carbon forestry to certain geographies such as erosion-prone lands, and marginal lands.

…keep Aotearoa in step with other countries

Other jurisdictions are focusing on reducing gross emissions. Without similar domestic reductions, Aotearoa risks being seen as out of step. This could affect:

- Aotearoa New Zealand's reputation
- access to markets and capital if overseas consumers and financial institutions increasingly demand specific climate standards for Aotearoa New Zealand's products and services.[25]

[24] Ministry for Primary Industries. 2022. *Afforestation and Deforestation Intentions Survey 2021: Final Report*. MPI Technical Paper No: 2022/19. Wellington: Ministry for Primary Industries.

[25] Current examples include the commitment by Tesco supermarkets (the largest buyer of Aotearoa products in Britain) that all its products have net zero emissions across their supply chain by 2050. Nestlé has made a similar commitment and is currently working with Fonterra to develop a net zero dairy farm in Taranaki.

…and result in multiple co-benefits

Reducing gross emissions could provide wider benefits, including to health, broader wellbeing, and the environment. For example, encouraging lower emissions transport can provide environmental benefits (reducing air and noise pollution, and congestion) and health benefits (due to active transport modes). Actions to improve insulation and heating efficiency in homes and buildings can similarly lead to better health and wellbeing.

The economic co-benefits should be emphasised first and with social and environmental co-benefits emphasised thereafter. We recommend this for pragmatic purposes associated with needing to deliver a climate change solution that is affordable and supports middle Aotearoa and their political representatives. Economic co-benefits of reducing gross emissions include reducing the exposure of the economy to future economic challenges such as inflation and recessions. This can be delivered by an energy-efficient economy that has lower energy-related operating costs. Examples of energy efficiencies that can come about through efforts to reduce gross emissions include a transformation in urban transport away from the private motor vehicle and towards urban rideshare modalities. Here, instead of owning a vehicle privately, urban dwellers can access a range of urban transport options including:

- Taxis and rideshare services (where the participant is driven by a driver).
- Rideshare vehicles (where the participant is the driver).
- Mass public transport (busses, light rail).
- Electric cycles and electric scooters.
- Transit-oriented urban design and planning that integrates residential property development with mass transport and cycleways.

When such services operate at scale there will be much less need for urban dwellers to own a private vehicle. They can instead pay for access to transportation services in a similar way that music has shifted from ownership (e.g., of CDs) to access (e.g., music streaming). When the above combination of urban transport modalities operates at scale the number of cars on the road per capita will drop significantly (reducing road congestion, travel times, and road maintenance costs). This will also reduce the number of rapidly depreciating assets that spend around 95% of their life parked and at risk of damage (private cars) for urban households, thereby lifting the economic wellbeing of urban dwellers (e.g., through a reduction of depreciation costs to private wealth).

The environmental, social, and health benefits of climate change policy can then be situated within a framework of enhanced economic wellbeing.

A STRONG AND STABLE NZ ETS PRICE SIGNAL SHOULD ENCOURAGE LOW-EMISSIONS CHOICES

A strong and stable NZ ETS price signal can help stimulate investment in research and development, which reduces the cost of low-emissions technology. Price stability is important to provide businesses and individuals with the certainty they need to make investments that reduce emissions. However, under current NZ ETS settings, significant falls in NZU prices might occur, discouraging businesses to make low-emissions choices.

Continued investments that are emissions intensive could risk locking in emissions many years into the future. They could also limit Aotearoa New Zealand's ability to respond to changing circumstances.

There is also a need to amplify the impact of the carbon price signal by reducing the ability of demand side NZETS participants to dilute the carbon price into homeopathic concentrations and then pass this onto their price inelastic consumers in a system that virtually guarantees minimal behaviour change.

WHAT IS A STRONG AND STABLE NZ ETS PRICE SIGNAL FOR GROSS REDUCTIONS?

Our understanding of the prices needed to reduce gross emissions will improve over time

We expect a strong and stable NZ ETS price signal to incentivise more gross emissions reductions than the NZ ETS price currently does.

Currently, prices in the NZ ETS reflect the expected supply and demand for units in the market, which are driven by the costs of reduction and removals, plus government policy designed to influence that price. This means the government does not set the price emitters face in the NZ ETS, nor the value of NZUs foresters receive for removals, although it can influence through its control of the auction market. This is not true. The government has routinely influenced the carbon price through policy levers. One only needs to look at the carbon price changes that occurred in mid 2023 when the government first ignored the Climate Change Commission advice on carbon pricing (which crashed the price in June 2023) and then changed its mind in late July 2023 (that lifted the price again).

The government has influenced the carbon price from the beginning of the NZETS by means of the option to buy from the government (fixed price option) at $25 combined with the 2 for 1 policy (this kept the market price close to the $12.50). The government imported cheap carbon credits from eastern Europe making carbon credits available to NZETS participants at around $0.20/tCO2e with the NZU price crashing to around $1.50. Then the government removed this option and the price rose again to $25 when the cheap imported carbon was not available and the 2 for 1 option was removed. Then the government changed the fixed price option to $35, and the market price responded, and on and on to the present day with the cost-containment reserve and the particular interests of the Prime Minister in any given month. The major influences on the NZU price since 2010 have been government policy – with minor influences by market forces.

Figure iv. NZU price history 2010-2023.

Key to Figure iv:

A. International carbon pricing influence prior to import of very cheap carbon credits from Eastern Europe.

B. Government imports very cheap carbon credits from Eastern Europe.

C. End of availability of very cheap carbon credits from eastern Europe. Start of government offering NZETS buyers a fixed price option of $25.

D. Fixed price option rises to $35.

E. Following enactment of Emissions Trading Reform Amendment Act where government introduces a cap on emissions within the NZETS.

F. Cost containment reserve set at $70.

G. Government decision to ignore Climate Change Commission carbon price control recommendations for the cost containment reserve.

As such, the government has every opportunity to steer the carbon price into desirable territory. It should do so without apology and keep prices in line with the social cost of GHG pollution and prices necessary to drive the kind of gross emissions behaviour change capable of causing a transformation to a 21st century economy.

A key enabling condition for carbon price stability is a government policy commitment to have carbon price stability and appropriate pricing. This commitment is not possible without cross party agreement among the major political parties.

To create a strong and stable price signal, changes in the NZ ETS price would be needed to reflect the higher costs of reductions to provide an effective incentive to reduce gross emissions.

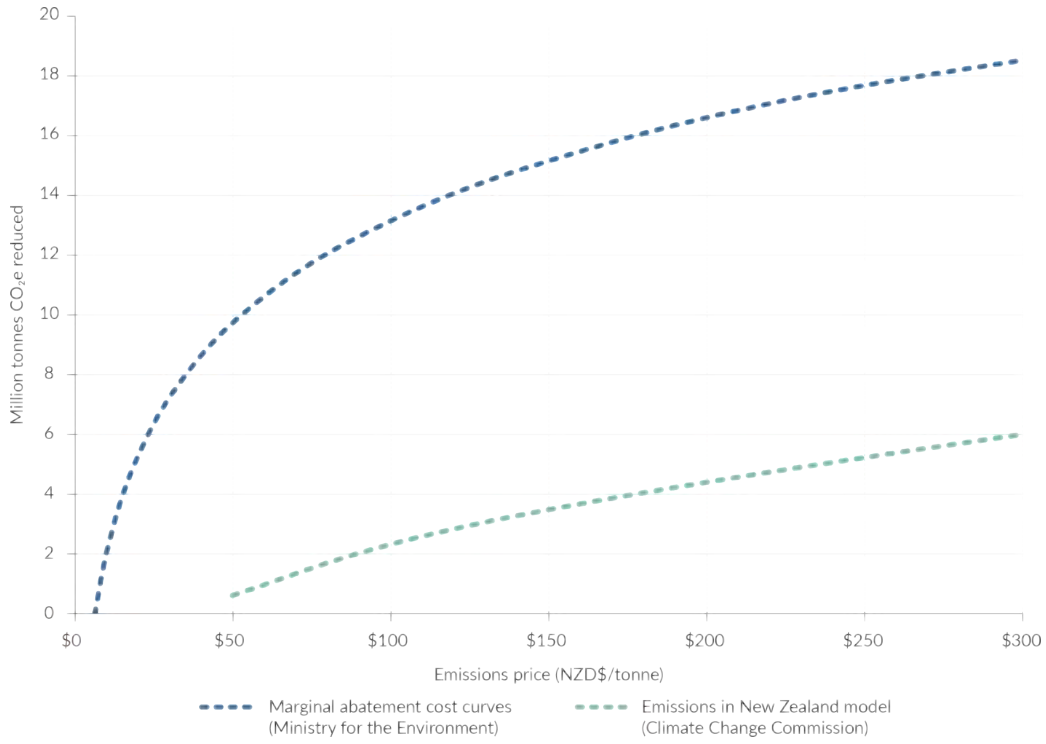
It is a nonsense that the carbon price in the NZETS is the product of market forces. It is the product of a combination of government policy (the big price changes) and market forces (the smaller price changes).

To estimate the kind of price pathway needed to drive material gross emissions reductions, we need to be able to assess the costs of reducing gross emissions in different sectors. We want the price that emitters face to be high enough that the decision to switch to low-emissions technology is the most cost-effective decision. The Government's intention is to give businesses time, opportunity and the incentive to change the way they operate.

Marginal abatement cost curves (MACCs) are an important tool for estimating the costs of reducing emissions. MACCs are models that show the abatement potential of greenhouse gas mitigation measures, and the relative costs associated with each of these measures. For example, replacing a coal boiler with an electric boiler may cost $50 per tonne of emissions that is reduced.

Figure 7 shows simplified and stylised MACCs estimated from different sources. These MACCs are derived from the Commission's Emissions in New Zealand (ENZ) model and work carried out by the Ministry for the Environment in 2018. They reflect the best knowledge we have to date and will improve over time.

Figure 7: Marginal abatement cost curves



Marginal abatement costs give an indication of the NZ ETS price where abatement options become cost effective and are more likely to be adopted.

However, it is important to understand the limitations of using MACCs. While they can be useful tools to help inform policy development, some uncertainty exists regarding the estimated abatement costs, particularly as we look further into the future.

Some variation exists between the MACCs presented here. This is because they are based on different methods, assumptions and data, and were developed at different times. For example, the Ministry for the Environment's older MACC includes cost estimates for a wide range of actions to reduce emissions, whereas the Commission's ENZ model assumes the price response is limited to fuel switching.

With these limitations in mind, the current MACCs suggest NZU prices will need to increase over time to drive increased gross emissions reductions compared with the status quo.

The government is looking to develop more accurate assessments of the costs of emissions reductions in different sectors. This will include improving the MACCs the government uses for climate mitigation policy. Information provided through this consultation will help us gain a better sense of the carbon costs needed to prioritise gross emissions reductions in the NZ ETS. As better information becomes available, our estimation of the optimal price pathway for driving gross emissions reductions will change.

We believe that government policy should be more informed by MACCs, with a particular reference to the strategic balance between gross emission reductions and removals. In our conceptual framework presented above we provided a conceptual model for determining the volume of gross abatement that could be targeted by government policy. This policy framework identifies the volume of abatement that could be delivered at or below the carbon price, and the volume of abatement that could be delivered through forest sector removals. The latter being those emissions that cannot be delivered by gross emission reductions below the carbon price per unit of abatement (Figure iii in our conceptual framework and repeated below with modifications).

Figure v. Marginal abatement cost curve for energy and industry sectors in 2030 with hypothetical carbon price of $85 added and delineation of three tiers of abatement: 1: abatement below zero on the cost curve; Tier 2: abatement above zero but below the carbon price; Tier 3: abatement above the carbon price that should be the only abatement addressed through offsetting. Modified from MFE (2020).

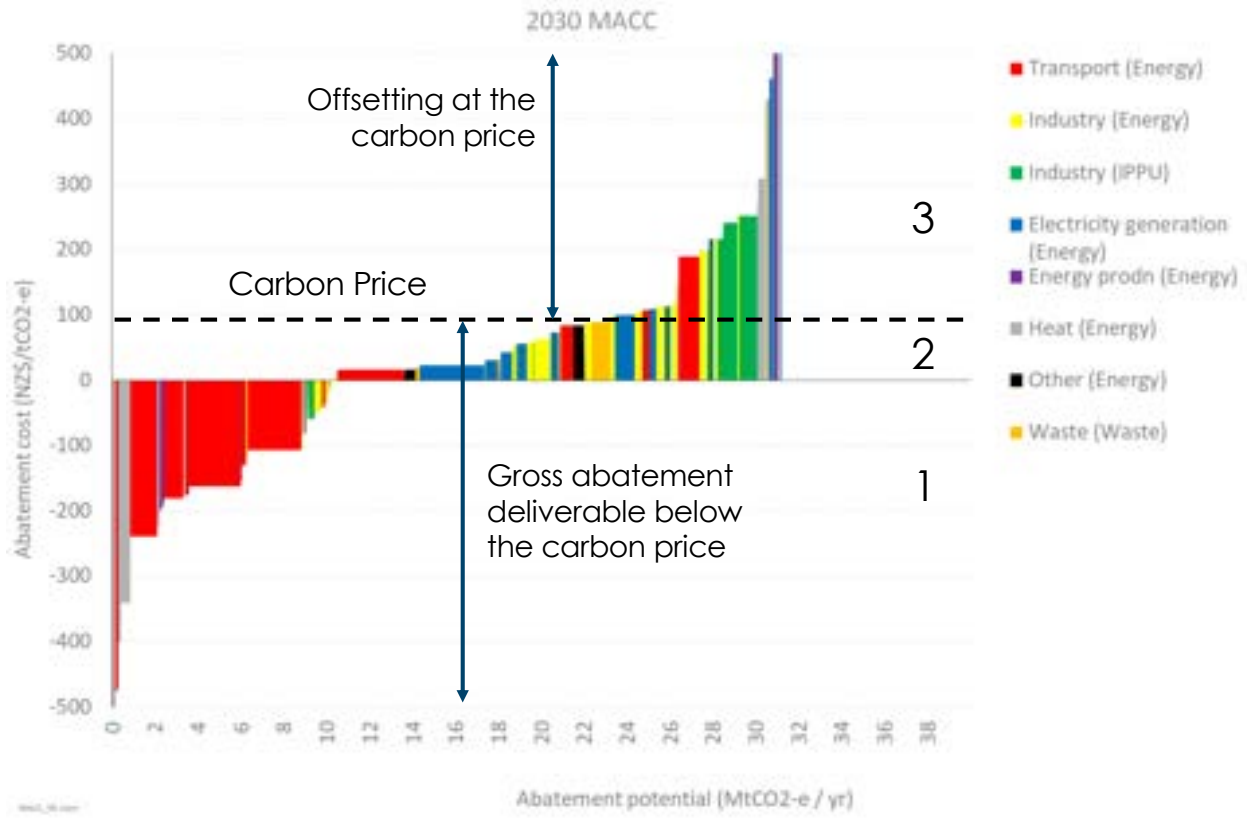


Figure vi. Concept diagram of the 'abatement tree'. Source: Ekos.

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The challenge for government policy and the design of the NZETS is how to cause gross abatement for emissions below the carbon price. One way of doing this is to a) properly price emissions, b) ensure that investors are exposed to those prices and c) impose a cap on emissions for demand side participants in the NZETS. Other ways include complementary measures such as:

- Targeted policies and regulation.
- Financial incentives.
- Government providing risk mitigation for private investment (e.g., functioning as a keystone investor, providing capital at a low cost of capital, underwriting investment risk).
- Stimulating a strong voluntary carbon market (VCM) and including energy and agriculture in this market (more below on our views on the VCM).

We note that there is a significant structural mismatch in that the future buyers of removals will not only be the current ETS emitters. So change is needed sooner or later. We recommend sooner and consolidating a framework that will be more enduring. This could include a step-wise approach where other measures (esp. complementary policies) can buy time for this discussion as an interim step, and therefore allow time for fully working through the larger-scale reform.

The current price corridor at auction

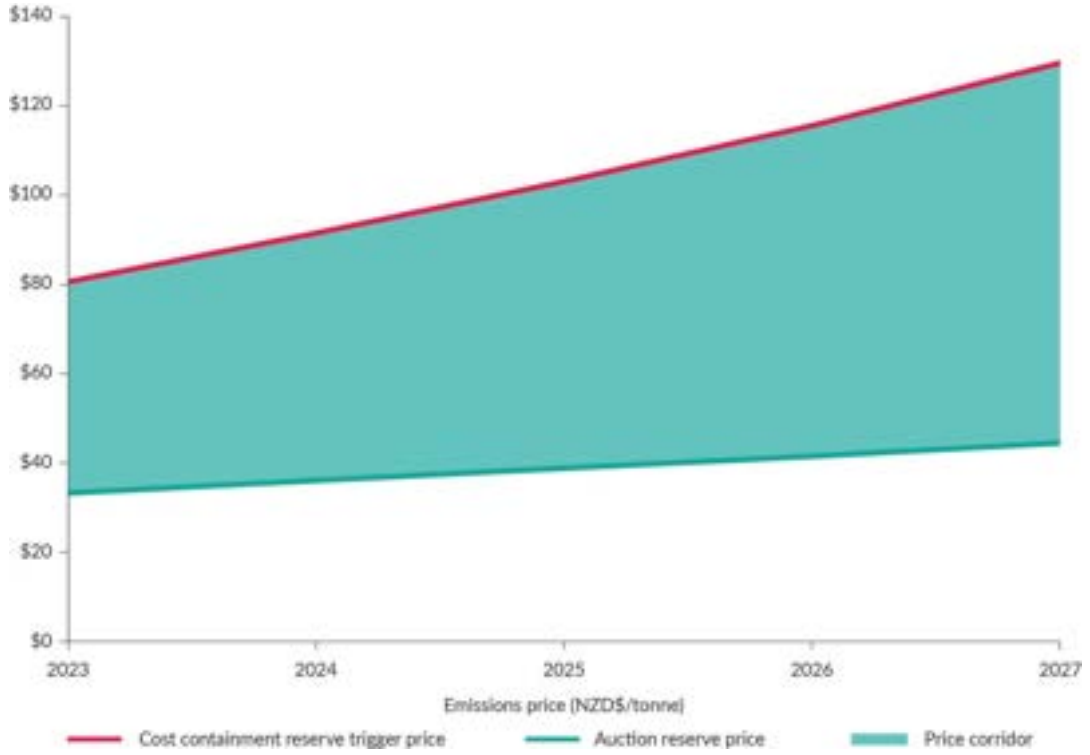
We have not identified the exact NZU prices required to drive gross emissions reductions. However, the existing price corridor within the NZ ETS auction market indicates the price range that would support the reductions in line with our emissions budgets and the 2050 target.

As discussed in chapter 1, price controls set lower and upper bounds for NZUs bought at auction and help to demonstrate that carbon prices are deeply influenced by government policy. When triggered, price controls can indirectly affect the market price for NZUs, helping to prevent prices that are unacceptably high or low. The current price control settings are wide enough to allow price discovery by the market.

The current price corridor was recommended by the Commission in Ināia tonu nei. It based this corridor on the prices needed to drive the reductions in their 'demonstration pathway'. The demonstration pathway modelled a feasible path to achieve the 2050 net zero target and the emissions budgets for the intervening years (figure 8).[26] The Commission recommended higher price control settings in its advice for NZ ETS units limits and price control settings for 2023–27[27] and 2024–28[28].

If NZU prices stay within this range, NZ ETS incentives should reflect the costs to reduce emissions in emitting sectors. It would also ensure prices are broadly stable and predictable, allowing participants to form expectations of future NZ ETS costs and have confidence to make low-emissions investments.

Figure 8: New Zealand Emissions Trading Scheme price corridor in Climate Change Commission demonstration pathway



[26] Last year, the Government updated the NZ ETS price settings to adjust for inflation. As a result, the current lower and upper bounds of the NZ ETS price corridor are slightly higher than what the Commission recommended in *Ināia tonu nei*.

[27] Climate Change Commission. 2022. *NZ ETS unit limits and price control settings for 2023-2027*. Wellington: He Pou a Rangi | Climate Change Commission.

[28] Climate Change Commission. 2023. *Advice on NZ ETS unit limits and price control settings for 2024-2028*. Wellington: He Pou a Rangi | Climate Change Commission.

While we are not consulting on the price corridor for the NZ ETS (because this was the subject of a separate consultation and ongoing regulatory process), we are interested in understanding what prices should look like, over time, to prioritise gross emissions reductions. Any information you have on the costs of emissions reductions could help to identify and determine an optimum, future price pathway for the NZ ETS.

A comprehensive package of measures is needed

Emissions pricing is not the only way to drive emissions reductions and removals in Aotearoa. The emissions reduction plan explains the Government's decision to use a portfolio approach, that is, a mutually supportive and balanced mix of emissions pricing, well-targeted regulation, tailored sectoral policies, direct investment (public and private), innovation and mechanisms that help nature thrive.

The portfolio approach reflects the fact that no one policy instrument, including emissions pricing, can achieve the necessary emissions reductions and removals that are needed to achieve our climate change goals. For example, some sectors (such as transport) do not always respond to price and other measures are more effective in driving the abatement required.

Impact of emissions pricing on transport emissions

The emissions associated with private transport are unresponsive to carbon pricing alone. We estimate that relying on the NZ ETS to increase the uptake of electrical vehicles without any other measures could require a carbon price of $575 per tonne.[29]

Emissions are paid for by the upstream suppliers of fuel, which is reflected in the price paid for fuel at the pump. Higher carbon prices alone are ineffective at reducing these emissions, because NZ ETS costs are a relatively small component of petrol prices and there are barriers that limit people's ability to switch to less emissions-intensive or alternative forms of transport.

The government has begun to address this through measures such as:

- fuel economy labelling
- the clean car discount and clean car standard, which change the relative prices of vehicles according to their emissions intensity.

These measures target vehicle purchasers who do not or cannot consider the lifetime benefits of low fuel and emissions intensity. In these sectors, the NZ ETS acts more like a revenue- raising tax, pricing the emissions produced but having only a small impact on the level of emissions at current NZU prices.

However, some examples of inelasticity may be short to medium term. If businesses and households expect higher carbon prices to be sustained, they are more likely to make choices that reduce their emissions. For example, households are unlikely or unable to dramatically change their driving habits in the short term in the face of higher fuel prices. However, they are more likely to invest in lower-emissions vehicles when purchasing their next vehicle.

Relying solely on complementary policies to drive gross emissions reductions would be inefficient. The broad, cross-sector coverage of the NZ ETS enables it to affect a wider range of decisions than would be possible with more targeted emissions reduction policies. Regulation and investment can help address some of the major structural, political and behavioural barriers to specific emissions reductions. However, they do not provide the same broad incentives as the NZ ETS for businesses and households to make lower emissions choices.

A price mechanism enables private actors to bring their personal knowledge of the costs and benefits of different transition options over time. An approach that focuses solely on complementary policies could see Aotearoa miss out on low-cost emissions reductions in the near term that are sensitive to price.

The Commission also listed in its 2023 draft advice challenges with an approach that relies on solely complementary policies, including the risk of shifting from a 'polluter pays' approach to taxpayers bearing most of the cost burden of gross emissions reductions.[30]

[29] Concept Consulting. 2021. *Shifting gear: How New Zealand can accelerate the uptake of low emission vehicles – Report 1: Policies to incentivise EV uptake.* Wellington: Concept Consulting.

[30] Climate Change Commission. 2023. *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan*. Wellington: He Pou a Rangi | Climate Change Commission. p 62.

What does this mean for the NZ ETS?

Our current evidence suggests that prices will need to rise to drive material gross emissions reductions, alongside complementary policies, to drive reductions in areas that are not responsive to price.

This implies that the design of the NZ ETS needs to give us the levers to create a particular price pathway for emitters. As discussed in chapter 2, the NZ ETS design currently does not do this. By creating these levers, we

will be able to adjust NZ ETS settings to deliver a preferred price pathway as our knowledge improves and we have more up-to-date information on the prices required.

A preferred pathway is one that drives the uptake of low-emissions technology and practices as quickly as real-world constraints allow. Real-world constraints reflect the limits of how quickly supply chains can deliver new equipment, or the speed with which people can learn how to use such equipment. Both the low-emissions technology and real-world constraints are expected to change over time.

We are seeking your feedback on whether this should be the preferred pathway for incentivising gross emissions reductions through our proposed primary assessment criteria (see chapter 6).

The aim of this review is not to determine the exact policy settings for the NZ ETS. Instead, the review explores whether we want to use the NZ ETS to create a preferred price pathway for emitters. If the answer is 'yes', the review seeks to identify what this preferred pathway is and how to adjust or redesign the NZ ETS design so it can deliver this price pathway.

The NZ ETS performance in failing to drive down gross emissions is sufficient evidence that a price-based mechanism is insufficient to successfully drive down gross emissions. In other words, emissions trading without gross emission reduction targets is not enough, particularly in price inelastic sectors like energy and transport.

For this reason, we believe that a more suitable approach is a cap-and-trade version of an emissions trading scheme. This can enable the allocation of allowance units to each demand-side participant in the NZETS (we will call theses participants points of obligation or POs) that is equal to their participant-specific target. This target could be determined by the government and calculated by dividing the collective emissions permissible by all POs by the number of POs. POs that fail to meet their target through gross emissions need to buy units from either:

- Other POs that have over-delivered on the target and thereby created spare allowance units for sale.
- Carbon credits from the forest sector.

This approach would potentially reduce demand volume for forest sector carbon credits. In turn, the forest sector supply of carbon credits could be restricted to those types of forestry activity that are capable of maximum co-benefit delivery to society. One prominent and much-needed example is the need to build climate-resilient rural landscapes through permanent continuous cover forestry (both exotic and indigenous continuous cover forestry). This activity is more costly than clear-cut plantation pine forestry and as such, the carbon price for supporting this activity would need to be high enough to deliver a profitable outcome. The clear-cut plantation forest industry has already enjoyed 15 years of carbon price stimulation and in the process generated a very large volume of carbon credits for the government. We think it is time that the clear-cut plantation forestry sector moves to a phase where its profitability is not supported by the additional revenue stream from carbon credit sales (except for Māori communities which we believe should continue to benefit from carbon pricing). This could lead to two ways of pricing carbon units for sale in the NZETS market: One pricing mechanism for allowances, and another pricing mechanism for carbon credits from continuous cover forestry and Māori-owned clear-cut plantations, and where pricing for both falls within the Climate Change Commission's recommended carbon price path.

If continuous cover forestry on erosion-prone lands was the core source of supply for forest sector NZUs, all investment into carbon forestry would be directed towards landscapes that need investment stimulation for building climate resilience. This approach would enable much needed land use change on these lands at no cost to the taxpayer. It would also help to create an economically viable alternative to pastoralism or clear-cut forestry on these lands – activities that have proven to create substantial contingent liability risks to downstream and downslope property, infrastructure and amenities.

Establishing forest management rules for NZETS forestry participants would also prevent "plant and leave" permanent forestry that has caused so much controversy in recent times.

INCREASING THE NZ ETS PRICE TO DRIVE GREATER GROSS REDUCTIONS COULD…

…increase the risk of emissions leakage

Increased NZ ETS costs for emissions-intensive and trade-exposed activities could cause some production to move offshore to countries without similar emissions-pricing policies. If these countries do not have a cap on emissions, there is the risk of increased global emissions. This is referred to as 'emissions leakage'. Carbon intensive, trade-exposed sectors can continue to be protected through the allocation of a higher percentage of allowances under a cap-and-trade system, thus reducing any incentive to move offshore. Such businesses are the highest fruit on the abatement tree and can be left there and supported through offsetting. The allowances allocated to such POs could be backed by forest sector carbon removals (i.e., offsetting). Doing so would be consistent with the logic of using marginal abatement cost curves to determine the economy segments that should be targeted for offsetting, as well as using removals to drive a net negative emissions future.

Similarly, new forests that displace current farms may result in some leakage of agricultural production. This could be mitigated by directing NZETS carbon forestry towards land types that are only profitable for agriculture because agriculturalists are not currently paying to take the silt out of downstream kitchens after a cyclone. In other words, the lands that are only profitable to farm because farmers are not covering the cost of their externalities and where those externalities are high (e.g., sediment trespass), are the very lands that should not be farmed.

Local government could be supported to provide market signals that pastoralism on such lands will need a resource consent after 2030. If this was delivered at the same time as continuous cover forestry is being promoted and supported as an economically viable alternative to pastoralism on erosion lands, then this would stimulate voluntary uptake of land use change to continuous cover forestry on such lands at low electoral risk at local body and central government elections.

Pushing reductions faster could result in a loss offshore of businesses that may have been able to adjust to a slower transition. No benefit would be gained for the climate if carbon pricing causes businesses to move their operations to countries that do not have a cap on emissions. Aotearoa New Zealand should, therefore, be a vocal member of the international climate policy community promoting caps for all nations. In practice this could also mean providing foreign aid support to such nations to assist them to bring such sectors into their Nationally Determined Contributions (NDCs) to the Paris Agreement.

The NZ ETS currently provides free NZUs to at-risk industries[31] (industrial allocation), to manage the risk of emissions leakage. We believe this is an appropriate use of the offsetting function of a well-functioning emissions trading framework. Industrial allocation is slowly being phased out, and high prices, particularly in the near term, could increase the risk of some activities becoming uncompetitive and moving overseas. Then don't phase them out and recognise that there is an appropriate place for carbon offsetting in the domestic economy. Such sectors need to not be shamed because they are carbon intensive. They need to be supported if they are strategically important to a low carbon future, particularly if they have capability and access to finance that could enable them to transition to lower carbon versions of themselves. For example, fossil fuel companies could transition to energy companies where they phase out the fossil element but use their domestic and international capability to do so. Recent government analysis suggests some industrial activities could wind down or stop by 2030 in response to higher carbon prices (but this will only work if their profitability is impacted by carbon pricing).[32]

[31] For more information, see Environmental Protection Authority. *Eligibility*. Retrieved 2 June 2023.

[32] Ministry for the Environment. 2022. *Regulatory Impact Statement: Updates to NZ ETS unit limit and price control settings regulations*. Wellington: Ministry for the Environment.

If high emitting businesses are closed, the effects would be felt unevenly across Aotearoa. Many high emitters are located in the regions and play an important part of the local economy. Closures would also mean affected regions experience greater economic and employment impacts. Then protect them and allow emissions offsetting to become a key part of their long-term transition to a low carbon version of themselves. Carbon intensive industries need more time than non-carbon intensive industries to transition to a low carbon future. Buying them this time through appropriate offsetting combined with government support to transition is an appropriate action. We note that the 2050 goal is net zero carbon, not gross zero carbon. Of course, this reflects the reality that getting to gross zero as a nation will not be possible by 2050, or potentially ever. We note here that fossil fuel emissions are not the only GHG emissions to consider. As long as we plan to eat food from agriculture, we will have agricultural emissions from soils, fertilizers, and ruminant animals. Moreover, removals are not just for offsetting NZETS emissions. They are also needed for balancing the whole economy and the need for net-negative emissions after reaching net zero.

The emissions reduction plan outlines the government's action to investigate long-term options to address emissions leakage beyond industrial allocation (one alternative is a carbon border adjustment measure). More information on the outcomes of this investigation will be announced in the future.

…affect the cost of energy

If changes to the NZ ETS to prioritise gross emissions reductions result in higher emissions prices, a range of impacts in the energy and industrial sectors are expected.

- **Wholesale electricity**: Higher emissions prices would lead to higher wholesale electricity prices in the short term. This is because we still require some fossil-fuelled electricity generation that incurs NZ ETS costs, particularly at times of high electricity demand or when Aotearoa experiences a dry year. These generation sources can set the price of wholesale electricity at these times. However, this impact should reduce as the proportion of renewable generation in the electricity system increases. We believe that it is also is time to support distributed electricity generation more fully by enabling distributed generators (e.g., household solar photovoltaic providers) to get higher-than-wholesale prices for the energy they contribute to the national grid. This would stimulate far greater uptake of distributed solar photovoltaic generation across households and businesses. In turn, this distributed generation that harnesses the free energy from the sun, would help to reduce household and business demand for electricity from the national grid and free up energy for charging electric vehicles and other electric devices.
- **Residential and commercial electricity:** Higher wholesale electricity prices from rising emissions prices would affect residential and commercial consumers' electricity prices. How electricity bills could change is uncertain. This could be mitigated by supporting solar photovoltaic electricity generation across households and businesses nation-wide.
- **Fossil gas**: Higher emissions prices will increase prices paid for fossil gas by consumers and increase the cost of gas production. Higher carbon prices will influence the pace of transition away from fossil gas, particularly for those consumers where other technologies (such as electricity) are readily available. It also creates investment risks for gas supply, particularly for fields with high fugitive emissions. This could lead to a further tightening in gas supply, but the exact impacts are still difficult to quantify.

We note, however, that fossil gas is among the lowest emitting of the fossil fuels and could/should be supported as an alternative to emissions-intensive fossil fuels such as liquid and solid fossil fuels. The fossil gas sector could be seen as an important strategic sector located in zone 3 of the abatement tree (Figure v above) and supported with forest sector offsetting.

- Diesel, petrol and coal prices: Higher emissions prices would increase prices for fossil gas, diesel, petrol, and coal for residential, commercial and industrial uses.

While this is true, a well-functioning transitional economy will create ample opportunities and favourable economic/financial circumstances for a transition away from fossil fuel energy, and therefore a transition away from exposure to carbon prices. We believe a core responsibility of government is to create enabling conditions to stimulate the institutional investor community to divest from fossil fuels and reinvest in clean technology. This includes reducing investment risk for clean technology investments by socialising that risk across the economy. This will stimulate a sea-change in investment behaviour in a sector (i.e., institutional investors) that is price elastic.

…affect household costs

Aotearoa households are exposed to the NZ ETS, largely through emissions price impacts on fuel and energy costs. The impact of emissions prices on other goods and services is usually more indirect, often reflecting fuel and energy as an input into production of that good or service, or as part of freight costs.

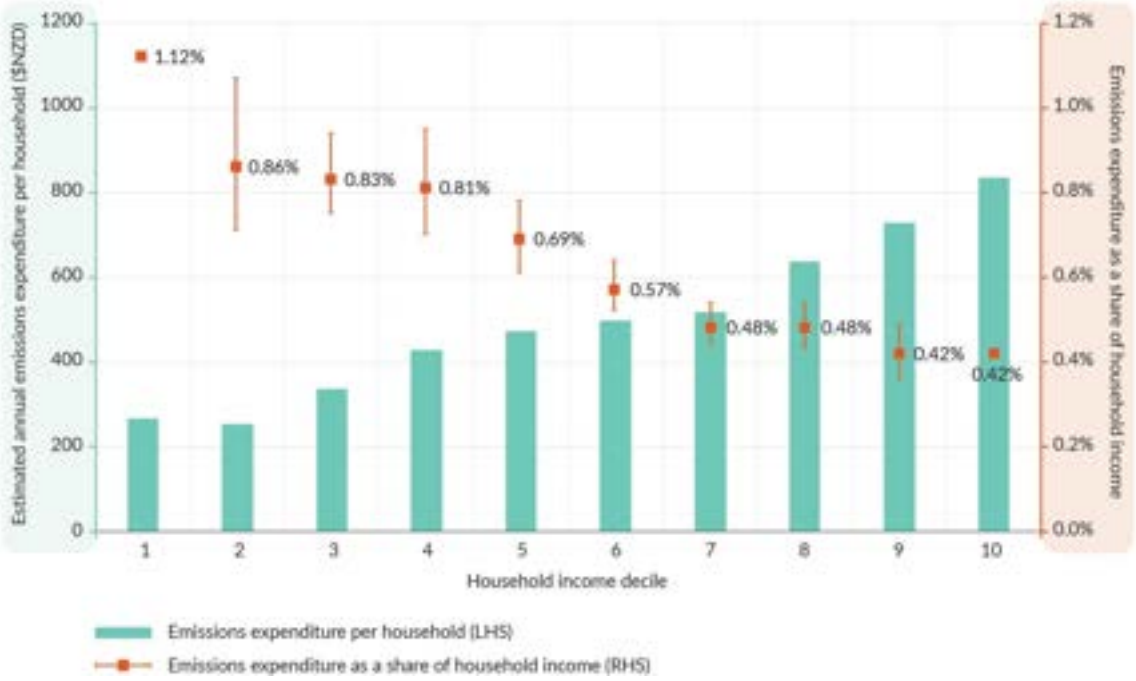
Although absolute expenditure on emissions prices tends to rise with income, lower income households tend to spend a greater share of their income on products and services that are affected by emissions prices (figure 9). That is, an emissions price can have a regressive impact on households. The Ministry for the Environment estimates that, at an emissions price of $75 per tonne of CO2e, expenditure on emissions makes up on average about 0.5 per cent of household gross income (just under $500 per year per household).

However, there could also be cost savings for households from shifting to a low-emissions economy. For example, greater investments in renewable energy, which would reduce the proportion of electricity derived from fossil fuels, would be expected to lower electricity prices in the long run. Also, higher petrol prices would be moderated over time by fuel switching and transport mode shifts driven by stronger NZ ETS incentives. These changes would help lower the costs of goods and services that currently include a substantial carbon component.

The government has the option of supporting households to transition away from carbon intensive appliances and technologies. This will enable carbon prices to remain high (to stimulate investment in clean technology) whilst reducing carbon price exposure in absolute terms to consumers.

We note that those more able to transition to low emissions technologies are the relatively wealthy. Māori form a very large proportion of low-income households and are, therefore, disproportionately exposed to carbon pricing (e.g., cannot afford an electric car or the newest and most energy efficient appliances). This is also true for all ethnic groups in the low-income bracket. As such, an equitable policy framework for low carbon households would need to include support to enable low-income households to access clean technologies.

Figure 9: Estimated household expenditure on emissions prices (at New Zealand Unit price of $75 per tonne carbon dioxide equivalent)



Source: Stats NZ, Ministry for the Environment, Ministry for the Environment calculations

Note: Vertical bars on the chart denote the change in expenditure as a percentage of the lower and upper brackets of each income decile, and the square denotes the change as a percentage of the mid-point of each income decile. The analysis assumes no behavioural changes from households in response to higher carbon prices that would reduce household costs.

Mitigating impacts on households

Instead of reducing the effectiveness of environmental policy, separate measures that target household income may be the best way to address regressive effects of emissions pricing.

In the context of the NZ ETS review, this would entail a design that drives the emissions reductions and removals that are needed, alongside complementary policies to address the impacts on households. Possible approaches include:

- carbon dividend: this is typically a payment linked to the level of the emissions price and paid to all individuals or households. Austria, Switzerland and several provinces and territories of Canada currently operate a form of carbon dividend.
- targeted support: another approach is to target support more closely at the households most exposed to the regressive impacts of emissions prices.

It is intended that Aotearoa New Zealand's equitable transition strategy will include initiatives to help reduce some of the costs imposed on households and communities by the NZ ETS. Targeted measures could help ensure that businesses and households with historically less access to low-emissions alternatives can shift their behaviour as emissions prices rise. The strategy will also identify actions to support households and communities to benefit from the transition and seize opportunities to address existing inequity.

REMOVALS WILL PLAY AN IMPORTANT ROLE IN MEETING OUR CLIMATE CHANGE GOALS

As discussed in chapter 2, forestry is currently a low-cost form of abatement. As a result, it is likely there will be a strong afforestation response if forestry participants receive the same higher price needed to drive reductions.

This response is likely to take the form of exotic afforestation, because this results in higher returns than indigenous afforestation. Increased afforestation will produce more NZUs to reflect the removals generated. If emitters are able to purchase these units to meet their surrender obligations, they will not be incentivised to reduce their emissions.

Table 3 sets out the role that removals are expected to play in meeting Aotearoa New Zealand's domestic and international climate change goals.

Table 3: Role of removals in Aotearoa New Zealand's climate change goals

Domestic climate change goals	
Emissions budget 1 (2022–25) • Limits net emissions to 290 Mt CO_2e **Emissions budget 2 (2026–30)** • Limits net emissions to 305 Mt CO_2e. **Emissions budget 3 (2031–35)** • Limits net emissions to 240 Mt CO_2e	Aotearoa New Zealand's first emissions reduction plan was published in May 2022 and includes the actions necessary to meet the first emissions budget and put Aotearoa on track to meeting the 2050 target. The second emissions reduction plan must be published in late 2024. Removals from existing forests are the cheapest way to meet our short-term emissions budgets.
Future emissions budgets (2035–40, 2041–45, 2046–50) • A new emissions budget will be set every five years from 2025	New forests can contribute removals to our future emissions budgets and the 2050 target over the medium and long term. This is especially true for multi-age, biodiverse forests which are also likely to be more adaptive to the impacts of a changing climate.

Domestic climate change goals	
2050 target • All greenhouse gas emissions (except biogenic methane) must reach net zero by 2050 • Biogenic methane emissions must reduce to 24–47% below 2017 levels (including a 10% reduction by 2030).	
International climate change goals	

Current NDC (2021–30) Commits Aotearoa to reducing net emissions to 50% below 2005 levels by 2030. This means that Aotearoa can produce net emissions of no more than 598 Mt CO_2e over the period 2021–30. There is a gap of about 190 Mt CO_2e between our current NDC and our gross emissions (based on the Climate Change Commission's demonstration pathway).	Net emissions reductions to meet this NDC will come from: • additional action within Aotearoa (building on the actions in the first emissions reduction plan) • purchasing offshore mitigation to fill the gap.[33] Options for additional domestic action include reducing gross emissions more quickly and increasing our removals. This Government has committed to prioritising domestic action as much as possible to achieve our 2021–30 NDC and climate change targets. Removals from forestry, which contribute to our 2021–30 NDC, cannot be materially increased.[34]
Future NDCs (from 2031) Aotearoa is due to communicate its next NDC (2031–35) by 2025	Removals, including from forestry, will be critical for meeting future NDCs, which are expected to be progressively more ambitious. Because a significant lag time exists in forestry between planting and realising significant carbon removals, decisions made now will have consequences for the role of forestry in meeting future NDCs. New forests established in the 2020s could provide a substantial portion of the net emissions reductions required to meet future NDCs. If prioritising gross reductions in the NZ ETS results in limiting forestry removals, this could have significant long- term impacts on the costs of meeting future NDCs.

What does this mean for the NZ ETS?

To ensure the NZ ETS can support both emissions reductions and removals, the balance of incentives within the scheme needs to be carefully considered. Changes to the NZ ETS are likely to be needed to create the necessary price pathways for both reductions and removals.

[33] While we will likely need offshore mitigation to support meeting our NDCs, we do not currently know how expensive offshore mitigation will be, and uncertainty on price will remain high. The government is expected to need to purchase between $3.3 billion and $23.7 billion in additional offshore mitigation to meet the 2021–30 NDC. See The Treasury and Ministry for the Environment. 2023. *Ngā Kōrero Āhuarangi Me Te Ōhanga: Climate Economic and Fiscal Assessment*. Wellington: The Treasury and Ministry for the Environment.

[34] This is due to the time it takes for the forest to remove carbon after it has been planted.

CONCLUSION

Our current evidence only suggests the range of prices needed to drive emissions reductions. This evidence will improve over time. As our understanding of the necessary price develops, we need to be able to adjust NZ ETS settings to support higher NZU prices. At the same time, we need to consider how this price will affect removals, as well as the incentive for emitters to reduce their gross emissions, given their access to NZUs from removals. Continuing to incentivise removals remains critical, given their importance to meeting our domestic and international targets.

The task is therefore to determine whether and how to change the NZ ETS so settings can be adjusted to drive and maintain the NZU prices needed to reduce emissions, while still maintaining strong incentives for removals that are needed to meet our climate targets.

CONSULTATION QUESTIONS

Chapter 3 Consultation questions	
3.1	Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.
3.2	Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?
3.3	How important do you think it is that we maintain incentives for removals? Why?

1.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

Yes, but we believe the NZ ETS needs to be modified to become a cap-and-trade mechanism rather than the current model of passing on a diluted carbon price to retail customers of those participants. Our reasoning is presented amply above. We believe that there is a compelling need for gross emission reduction targets for demand side participants in the NZ ETS.

We believe that the policy settings for abatement vs offsetting at the national level in the NZ ETS should be informed by the MFE modelling on marginal abatement cost curves and using our suggested model of three tiers of response: Tier 1 stimulate abatement below zero on the cost curve; Tier 2 additional stimulation to engage cost positive abatement but below the carbon price in any given year; Tier 3 reserved for offsetting and applicable to abatement that would cost more than the carbon price to abate in-house.

1.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

Not entirely. This is because the current model allows NZ ETS demand side participants to pass all or most of their abatement onto their price-inelastic customers, many of whom are not sufficiently impacted by the carbon price as to stimulate a change in behaviour towards clean technology and clean development.

As a nation we need to sharpen and amplify the beneficial impact of existing carbon prices before considering using higher prices as a blunt instrument. Sharpening and amplifying the beneficial impact of current carbon prices means exposing institutional investors to carbon price exposure to motivate them to divest from dirty technologies and reinvest in clean technologies, and where this change in behaviour happens upstream in the system. The reason for this needing to happen upstream in the system (e.g., producers and distributers of fossil fuelled services) is that this can enable transformational system change, rather than piecemeal and incremental change at the downstream end. It also enables such transformational system change to take place without having to motivate the downstream population. This is a politically easier modality for system change because it does not rely on widescale changes in values among consumers. Instead, this upstream approach stimulates system change that can take place without consumers having to drive that change. Consumers can just adapt to the changing circumstances where, for example, they discover that the only cars available for purchase are electric, and the only electricity they can purchase is renewable.

We also believe that carbon prices should be managed by the government to remain within the band of the Climate Change Commission's recommended price path and Treasury's estimation of the social cost of GHG pollution in its Shadow Emission Prices. Ideally, this should track no lower than the mid-range of these price bands so that such pricing is sufficiently conservative and can function as a robust price signal to institutional investors who are exposed to these prices.

1.3 How important do you think it is that we maintain incentives for removals? Why?

This is of fundamental importance, because removals will remain a fundamental component of the overall system, particularly if the approach is to target emission reductions for Tier 1 and 2 abatement (abatement below the carbon price) and use Tier 3 abatement (i.e., offsetting) to target those emissions that are either impossible or prohibitively expensive to abate. This will enable the nation to justify offsetting for trade-exposed carbon intensive industries, and for the proportion of emissions for the remaining industries that are prohibitively expensive to abate in-house.

We believe that the source of removals needs to be directed towards activities and geographies that maximise the delivery of climate resilience co-benefits. We believe that a core element of this approach be continuous cover permanent forestry in erosion-prone landscapes and land classes. Such continuous cover forestry should include exotic continuous cover forestry, exotic continuous cover forestry transitioning to native forest, and permanently protected native forest.

Chapter 4: Changes to the NZ ETS would be significant for Māori

The proposals in the NZ ETS review would have a variety of impacts and opportunities for whānau, hapū, iwi and Māori.

This chapter provides an overview of areas that have been identified by our previous analysis and engagement with Māori. It concludes by seeking your feedback on:

- whether Māori rights and interests have been described correctly
- anything we may have missed
- the impacts you consider the most important.

Chapter 6 asks for feedback on how specific options for change will affect the Māori rights and interests described here.

The NZ ETS review is significant across a range of Māori communities and their interests

Māori have made clear that they have a profound interest in Aotearoa New Zealand's climate response.

Climate change, and the actions we take to mitigate it, have a significant impact on the relationship of Māori to whenua, ngāhere, moana and physical taonga.

As rangatira, kaitiaki, land and forest owners, rural communities, workers, business owners and whānau who are subject to rising costs of living, Māori have a specific interest in changes to the design and operation of the NZ ETS. Previous consultations have reiterated that, to achieve an equitable transition for Māori, the Government needs to:

- consider Māori interests
- reduce existing barriers for Māori participation
- avoid creating new inequities in its climate response.

The impact of the NZ ETS review on forestry opportunities will be particularly relevant to Māori. Around 30 per cent of Aotearoa New Zealand's 1.7 million hectares of plantation forestry is estimated to be on Māori land. This is expected to grow to 40 per cent as Tiriti settlements are completed.

Forestry provides economic and employment opportunities, as described in chapter 1. In 2018, Māori were estimated to own $4.3 billion of forestry assets and some 2,200 Māori were employed in the sector (40 per cent of the forestry workforce – nearly three times more than their representation in general employment).[35]

[35] Reserve Bank of New Zealand. 2018. *Te Ohanga Māori – The Māori Economy 2018*. Wellington: Reserve Bank of New Zealand.

Various other government work programmes sit alongside the NZ ETS that will need to be considered collectively to support the role of mana whenua as kaitiaki and rangatira for their communities. These programmes include the current consultation on options to redesign the permanent forest category, as well as the development of both a domestic voluntary carbon market and biodiversity credit system.

This chapter, and the analysis of options in chapter 6, considers Māori interests in the NZ ETS review because of the potential impact of the NZ ETS on:

- the nature and ambition of Aotearoa New Zealand's climate response
- the feasibility of different land-use options for whenua Māori
- costs of living for whānau and businesses.

The Crown's obligations to consider these rights and interests stem from te Tiriti and its principles, the Climate Change Response Act 2002 provisions and commitments made in Tiriti settlements.

Māori have expressed a strong interest in the nature and ambition of Aotearoa New Zealand's climate response

Climate change is already visible in the Aotearoa landscape. Māori wellbeing in both rural and urban areas is being affected, as is Māori exercise of rangatiratanga and kaitiakitanga over their whenua, ngāhere and moana.

The negative impacts of climate change have led to calls from some Māori for greater ambition in Aotearoa New Zealand's climate response. A claim to the Waitangi Tribunal, for example, states that "[t]he New Zealand Government's response to the threat of global climate change represents a breach of the Crown's Treaty of Waitangi obligations towards Māori and Māori have and will continue to suffer prejudice as a result".[36]

[36] This quote is from paragraph 3 of the statement of claim to Wai 2607, dated 30 May 2016.

The options considered in chapter 6 vary with respect to the nature and ambition of Aotearoa New Zealand's climate response. They range from prioritisation of gross reductions while maintaining support for removals, to allowing for an increase in both reductions and removals.

Proposals would affect the viability of different land-use options by changing the incentives for exotic forests, indigenous forests and pastoral farming

The NZ ETS reward for removals is having a significant impact on the relative attractiveness of different land-use options. Activities that remove large volumes of carbon fast and at low cost (such as pine forestry) are more attractive as carbon prices rise, as set out in chapter 2.

Māori have expressed differing views on the increase in returns to exotic forestry. During consultation on the permanent forest category of the NZ ETS in 2022, most Māori forester submitters said that NZ ETS returns for forestry provide a unique opportunity for Māori land owners and communities. They noted the substantial proportion of Māori land that is suitable for afforestation but marginal for other uses, due to it being remote and less versatile. Many argued that ~~pine~~ exotic forests provided a financially viable pathway to permanent indigenous forests, and that long-lived exotics or continuous canopy productions were important permanent forestry options.[37] Māori submitters also pointed out that, in addition to the financial returns, forestry was an important employer of Māori in rural and regional communities.

Some Māori land owners, however, were concerned about the high incentives for pine forestry and wanted greater direct support for indigenous afforestation and regeneration, including from the NZ ETS. This has been a consistent theme of the government's engagement with Māori. Incentives for more indigenous forests and other nature-based solutions could provide opportunity for Māori to exercise kaitiakitanga and support restoration and protection of not just ngāhere but the cultural practices and mātauranga they support. The broader outcomes the NZ ETS, and other complementary policies, could support are discussed further in chapter 7.

Finally, some Māori have joined other pastoral farmers in expressing concern about the increased incentive to afforest land that is currently being used for sheep and beef farming. This can be remedied by directing the

permanent forest category towards erosion-prone lands that cannot be sustainably used for agriculture due to the sedimentation risk posed by farming on such lands.

The options considered in chapter 6 vary in their impact on the price that forestry removals would see from the NZ ETS. They also vary in their ability to provide a differential reward from different types of forests (eg, to increase the incentive for biodiverse, indigenous afforestation).

Increasing the cost of emissions is likely to affect the cost of living, including for whānau Māori

Increasing the cost of emissions will have implications across the economy, with flow-on effects for households and communities.[38] Whānau Māori are disproportionately represented in lower income groups with the most limited ability to absorb cost increases. We strongly agree with this statement.

[37] Ministry for Primary Industries. 2022. *Managing exotic afforestation incentives: A discussion document on proposals to change forestry settings in the New Zealand Emissions Trading Scheme.* Wellington: Ministry for Primary Industries.

[38] For example, the fuel supplier sector may pass costs onto their consumers, which could increase the cost of transporting goods, in turn increasing food prices and the cost of other household items.

The options considered in chapter 6 vary in the degree to which they would raise the NZ ETS price for carbon emissions, with flow-through into costs across the economy.

The NZ ETS review will also impact on the rights and interests of future generations

Around half the Māori population is under 25 years old. The effect of this review on future generations, which is complex and nuanced, is therefore of immense importance to Māori.

Chapter 3 set out the case for prioritising gross emissions reductions, while maintaining support for removals. One of the rationales for driving gross emissions now is to reduce the burden of reducing gross emissions on future generations. Enabling the application of mātauranga Māori and nature-based solutions, which extend beyond forestry, is a significant part of Aotearoa New Zealand's climate change response.

However, the Government also recognises that the NZ ETS review could disadvantage future generations, particularly through options that may limit forestry opportunities. As well as being essential to our climate response, forestry is an important source of income and livelihood for Māori. Limiting economic opportunities in the short term may leave future generations less able to respond to climate change and to realise wider social, economic and cultural aspirations.

The government is keen to hear views and evidence on the impact of this review on the rights and interests of future generations.

Māori never asked for a gold-plated climate change response framework. Instead, Māori are asking for an ambitious yet affordable climate change response framework – one that will minimise the cost and inflationary pressure on Māori communities.

The government will support Māori kaitiakitanga and rangatiratanga

The government is committed to embedding te Tiriti in the Crown's climate response. The NZ ETS review is one of several mechanisms to enable Māori aspirations for kaitiakitanga and rangatiratanga of whenua and taonga.

Although this consultation is largely focused on the NZ ETS review, we welcome broader feedback from Tiriti partners on how to approach an equitable transition for Māori to a low-emissions, more sustainable and resilient Aotearoa in the face of climate change.

CONSULTATION QUESTIONS

Chapter 4 Consultation questions	
4.1	Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?
4.2	What other interests do you think are important? What has been missed?
4.3	How should these interests be balanced against one another or prioritised, or both?
4.4	What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

Yes.

4.2 What other interests do you think are important? What has been missed?

What has been missed is that the Māori need for an affordable climate change response, including climate change mitigation and climate resilience, means that GHG removals need to be delivered in a manner that:

- Is financially/commercially viable and has the long-term stability to attract investment and deliver financial returns on that investment.
- Maximises rural employment opportunities for Māori.
- Maximises rural economic development and wealth generation opportunities for Māori, particularly with respect to economically challenging lands remaining in Māori ownership or those received in Treaty settlements.
- Focuses on optionality so that Māori landowners can make decisions regarding the sustainable development of their land according to their own tikanga.
- Enables a financially viable option to build climate resilient landscapes on erosion prone lands, maximising the use of commercial investment to achieve this.
- Helps to encourage transformation in the New Zealand forest industry towards greater use of continuous cover foresty systems, with associated environmental co-benefits.
- Makes the reforestation and regeneration of forests financially viable, particularly on land where clear-cut harvesting and/or pastoralism is inappropriate.

4.3 How should these interests be balanced against one another or prioritised, or both?

The priority for Māori is a climate change response that is affordable and can contribute to the prosperity and wellbeing of rural Māori communities, whilst enabling them to build their own resilience both economically and in relation to sustainable land management.

Balancing priorities between the ‘expensive nice-to-have’ and ‘affordable must-have’ solutions needs to favour the affordable ‘must have’ solutions. The affordable ‘must have’ solutions include reforestation commercial ventures that build climate resilience whilst delivering economic development opportunities for rural Māori. Because carbon financed indigenous reforestation at scale has repeatedly proven to not be financially viable, it is imperative that the government continues to enable restorative reforestation through exotic continuous cover forestry.

4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

We see Māori having enormous opportunities to engage in the kinds of carbon financed continuous cover forestry listed in 4.3 above, and this forming a major element of the Māori economy and Māori economic self-determination.

Chapter 5: Objectives and assessment criteria

The Commission has recommended that the Government consider how the NZ ETS may be amended to:

- provide more robust support for gross emissions reductions.
- manage the amount of exotic forest planting it drives by focusing that planting on building climate resilient landscapes.

The Government has accepted these recommendations, subject to this review of the NZ ETS. The primary objective of the review is to consider whether the NZ ETS should prioritise gross emissions reductions, while maintaining support for removals. This could mean ensuring the NZ ETS provides a strong and stable price signal of the cost of emissions to the economy.

This could help drive more gross emissions reductions in the energy, transport, industrial processes, and waste sectors than the status quo, while also encouraging removal activities across the economy.

PRIMARY ASSESSMENT CRITERIA

The proposals in this consultation have been assessed against the primary objective for the NZ ETS review using the primary criteria outlined in table 4.

Table 4: Primary assessment criteria

Primary criteria	Description
Incentivises additional gross emissions reductions	The NZ ETS supports more gross emissions reductions than the status quo by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow. It does this by providing a strong and stable price signal to incentivise gross emissions reductions. It also does this by ensuring that carbon pricing impacts upon the profitability of demand side NZ ETS participants, by imposing gross emission reduction targets, reducing the ability to simply dilute the carbon price signal by distributing the carbon price to their price inelastic customers, and consequently limiting the volume of forestry removals required to meet our Paris Agreement obligations.
Incentivises emissions removals	The NZ ETS drives levels of removals sufficient to help meet our climate change goals in the short to medium term and to provide a sink for hard-to-abate emissions in the longer term. It does this by providing a strong and stable price signal that rewards removal activities. The nation will also benefit from reducing the volume of abatement to be purchased from offshore. If the taxpayer is being asked to buy 100 million tonnes of carbon benefits from offshore, we believe that this money would be better spent causing additional abatement and removals domestically. For example, the nation needs to reforest around a million hectares of erosion-prone pasture and marginal land into permanent forest for climate resilience. This reforestation should be funded through the NZ ETS so that this climate resilience outcome can be delivered at least cost to the taxpayer and so that the nation spends less taxpayers money on buying carbon benefits from offshore supplies.

KEY CONSIDERATIONS

Alongside the primary criteria, several key considerations are used to assess the consultation proposals (table 5). These considerations can help us draw out and evaluate many of the important economic, distributional and Tiriti impacts from changes to the NZ ETS to prioritise gross reductions while maintaining support for removals.

Table 5: Key considerations for assessing the consultation proposals

Consideration	Description
Supports meeting NDC	The NZ ETS helps Aotearoa achieve the 2030 NDC and future NDCs, as much as possible, through domestic actions. This includes providing emissions removals that can offset emissions that are outside the NZ ETS.
Affects the functionality of the NZ ETS market	Impacts on the functionality of the NZ ETS market are assessed along three dimensions: • degree of change – the extent the design of the NZ ETS market changes and the ease of implementing such changes • complexity of the market – the extent changes to the NZ ETS increase the complexity of the market and impose new costs for participants and the government • degree of government intervention and/or control – the extent to which the government influences and/or determines NZ ETS outcomes and the degree to which private players do this in the market.
Manages overall costs to the economy and households	The costs imposed by the NZ ETS on the economy, households, different sectors, regions and the government are broadly acceptable. Additional costs imposed by the NZ ETS on vulnerable groups and communities are mitigated as much as possible through NZ ETS settings and companion policies. Changes to revenue earned by the government from NZ ETS auctions enable continued support for these companion policies.
Mitigates distributional impacts	The distributional impacts imposed by the NZ ETS across regions, sectors, communities and generations are acceptable.
Gives effect to te Tiriti o Waitangi	Changes to the NZ ETS give effect to the principles of te Tiriti o Waitangi.
Supports co-benefits	The NZ ETS supports other climate and environmental government objectives, alongside incentivising emissions reductions and removals.

Trade-offs will be likely between options when assessed using different criteria and considerations

When assessing the proposals included in this consultation, trade-offs will be necessary between some criteria and considerations.

For some options, the main trade-off will be between the primary assessment criteria, namely:

- prioritising gross emissions reductions.
- driving emissions removals.

This trade-off results from the fact that, in some options, prioritising gross reductions in the NZ ETS limits the access of emitters to removals and will likely reduce the incentive for these removals (if no additional actions

are taken). But, when coupled by reducing dependency on buying 100 million tonnes of carbon benefits from offshore, we can ensure that any reduction in removals does not cause the taxpayer to have to pay for building climate resilient landscapes when the NZ ETS could have done so.

Any options that reduce removals will affect Aotearoa New Zealand's ability to meet NDCs through domestic actions. Other options enable support for both reductions and removals in a way that is consistent with the Government's objectives for Aotearoa New Zealand's climate transition. All the options will impose economic and household costs. But these can be limited when the use of market mechanisms is maximised so that the cost burden moves from the taxpayer to the private sector in a robust low carbon economy. However, some variation is likely in the extent of these costs and how they are distributed across Aotearoa and among different groups. The key point about exposing private sector investment to carbon prices is that this does not have to just raise prices in their value chains. This is because private sector investors can divest from dirty technology and dirty development reinvest in clean technology and clean development. This will reduce their exposure to carbon prices and gradually remove this externality from the economy. This will also drive huge efficiency gains in the economy and lower medium-term and long-term operating costs across the economy. This will amount to the kind of transformation in the economy that is needed to avoid dangerous climate change.

CONSULTATION QUESTIONS

Chapter 5 Consultation questions	
5.1	Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?
5.2	Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?
5.3	Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard- to-abate emissions in the longer term? Why/why not?
5.4	Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.
5.5	Are there any additional criteria or considerations that should be taken into account?

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?
Yes. Our detailed response is provided in the text above.

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

Yes. Our detailed response is provided in the text above.

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard- to-abate emissions in the longer term? Why/why not?

Yes. And these removals should be targeted towards building climate resilient landscapes to reduce the contingent liability risk associated with the pipeline of ex tropical cyclones that will soon become the norm. Also, these removals should be used to reduce the volume of offshore mitigation that the government is currently planning. If these removals can be delivered through the NZ ETS, then:

a) The cost burden for this mitigation will be borne by the private sector rather than the taxpayer, and

b) The nation will have a major component of the national climate change adaptation agenda funded by the private sector at no cost to the taxpayer.

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

Yes, but we believe there is more to the strategic design of the NZ ETS that needs to be considered:

a) We need to maximise the opportunity to use private sector funded climate change mitigation to fund climate resilience.

b) We need to maximise the use of market-based mechanisms for both climate change mitigation and climate change resilience to minimise the cost burden on the taxpayer and associated inflationary pressures that this will entail.

c) We need to continually make it clear that the majority of businesses in the country have the opportunity to insulate themselves from the negative impacts of carbon prices if they transition to clean technology and clean development options that are not exposed to carbon prices.

d) We need to emphasise that the purpose of carbon pricing is to change behaviour and where this behaviour change will benefit those who made the change due to increased energy efficiencies and reduced energy costs.

5.5 Are there any additional criteria or considerations that should be taken into account?

We have listed additional criteria above, particularly those focused on maximising the climate resilience co-benefits of an NZ ETS that uses carbon financed continuous cover forestry to build climate resilient landscapes.

Chapter 6: Options identification and analysis

This review has identified a range of high-level options that would strengthen the incentives for gross emissions reductions in the NZ ETS.

These options primarily focus on curbing our gross emissions reductions. However, they also consider the important role of removal activities.

Options vary in their impact on removals, and these trade-offs will need to be worked through.[39] This focus on removals reflects the Government's broader commitment to nature- based solutions that remove carbon, increase resilience, and promote greater biodiversity.

Your feedback on these options will lead to a better understanding of the options' strengths and weaknesses, which will also help in refining the options.

THE NZ ETS REVIEW HAS IDENTIFIED FOUR HIGH-LEVEL OPTIONS

This discussion document outlines four high-level options for increasing the incentives for gross emissions reductions in the NZ ETS, while retaining or increasing the support for removal activities. These options also support the key considerations used to assess the consultation proposals.

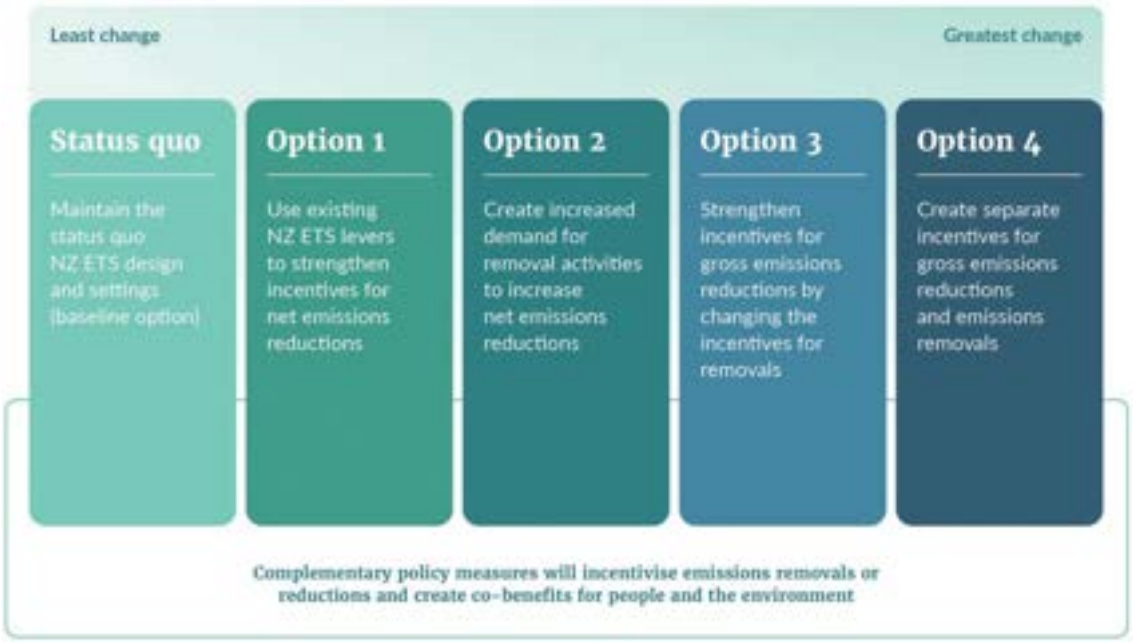
These options indicate the different changes the government could make and the

possible impacts and trade-offs these options involve. Because these options could be applied in different ways, we have provided examples under each. These examples are not intended to be a definitive list. Other options and examples may be identified through this consultation process. These options are briefly summarised in figure 10, with more detail included below.

We are currently consulting on proposals to update the permanent forestry category. The government decisions that are taken following that consultation will form part of the package of incentives for removals and will be considered alongside this review.

[39] This analysis has not yet considered the differences between how removal activities already registered in the NZ ETS and the registration of new removal activities in the future will be impacted. This difference could be a consideration in the design and application of an option, and your views are welcome. It also has not considered how the options will impact on forestry activities that have surrender obligations. This would be worked through in subsequent analysis.

Figure 10: Proposed options to strengthen the incentives for gross emissions reductions in the New Zealand Emissions Trading Scheme



COMPLEMENTARY POLICY MEASURES COULD...

...support wider environmental benefits

The Government is exploring the role that a biodiversity credit system could play in supporting biodiversity, complementing carbon markets, and encouraging nature-based responses that build resilience. Such a system could recognise biodiversity protection efforts or outcomes and attract philanthropic, corporate and community investment to directly reward actions that protect, expand or enhance indigenous diversity. This could help to:

- support the objectives of the Aotearoa New Zealand Biodiversity Strategy | Te mana o te Taiao
- complement regulatory protection of biodiversity through national direction and resource management reform
- incentivise specific removal activities with co-benefits (such as indigenous afforestation)
- align with the incentives for indigenous afforestation in the proposed redesigned permanent forest category (currently out for consultation).

...incentivise additional removal activities that support wider environmental benefits

The Government is currently developing a policy framework for a domestic voluntary carbon market (VCM), in which businesses and organisations can purchase credits to offset hard-to- abate emissions targets and meet their climate targets. The VCM can mobilise private investment to support reductions and removals in addition to those driven by the NZ ETS.

Additionally, the Carbon Neutral Government Programme requires government agencies to reduce their emissions and offset those that they cannot reduce by 2025. This will create demand for carbon credits and could increase demand certainty for VCM project developers, as well as supporting further emissions reductions and removals.

…help businesses to transition to low-emissions technologies

Businesses can face large upfront costs when upgrading their infrastructure or equipment to low-emissions alternatives. This financial barrier can delay an organisation's ability to reduce their gross emissions. The Government has established the Government Investment in Decarbonising Industry Fund to support valuable decarbonisation projects. The programme will see around $650 million of capital grants co-investment made available to support valuable decarbonisation projects and achieve a just transition.

As outlined in figure 10, the degree to which the government intervenes in or redesigns the market varies from option to option. Each high-level option could be implemented in several different ways.

For example, under option 2, NZUs could be purchased by the government or sold to international carbon markets. The impacts of how the options are applied may vary, but they aim to achieve the objectives of incentivising additional gross emissions reductions and emissions removals in a similar way.

Although they are presented as discrete options, components within each option could be combined into a package following consultation. For example, option 3 (which could restrict the use of units allocated for removal activities from surrender obligations) could be combined with option 2 (where the government becomes an additional buyer of these units).

These options and an initial assessment of their expected impacts are detailed below.

Giving effect to te Tiriti o Waitangi and recognising Māori interests

The options set out above will affect different Māori interests in a variety of ways. Chapter 4 explored the importance of the NZ ETS review for Māori due its potential impact on:

- the nature and ambition of Aotearoa New Zealand's climate response
- the feasibility of different land-use options for whenua Māori
- costs of living for whānau and businesses.

This chapter contains an initial assessment of the options on these broad categories of Māori interests (described in more detail in chapter 4). It seeks feedback from Māori on whether the impacts identified are correct and which impacts are the most important. It also seeks feedback on preferred options.

Limitations of the options analysis

It is not possible to predict with certainty how private actors will respond to policy changes. This review presents a qualitative assessment of how the market is expected to respond to the options. However, the assessment of whether the proposals will meet the Government's objectives includes assumptions about:

- the actions that actors take to reduce their emissions in response to price, especially because some non-price measures (such as regulation or direct investment or both) may reduce barriers and increase the price response
- changes to removal activities (noting that these have been made independently of projections of wider developments in land prices, which may affect the economics of competing land-use activities)
- future rates of afforestation, based on historical responses to price changes.

Predicting the cost that each option will pose for the government is difficult, because it will depend on the level of abatement that the NZ ETS contributes towards Aotearoa New Zealand's NDC. The level of this contribution will influence how many offshore units are needed to meet the NDC, the price of which is uncertain.

We have assessed the potential costs to the government on the assumption that the cost of incentivising additional domestic abatement will be cheaper than purchasing units offshore. The government is expected

to need to purchase between $3.3 billion and $23.7 billion in additional offshore mitigation to meet the 2021–30 NDC.[40]

These assumptions do not remove the underlying uncertainty within the analysis, and our analysis to date has been limited to the high-level options. Before the government makes its final decisions on the NZ ETS review, detailed modelling and analysis will be undertaken. This analysis will examine how proposals will be applied to existing NZUs or registered forests and will be informed by evidence gathered through this consultation.

Where relevant, we have described the specific caveats that apply to individual options.

The stockpile creates some uncertainty

The ability for NZ ETS participants to hold or 'bank' NZUs has led to considerably more units being held in private accounts than is needed to meet surrender obligations (referred to as the 'stockpile' and described in chapter 1).

The stockpile of units provides essential liquidity in the NZ ETS secondary market, so buyers can find NZUs to purchase, and sellers can easily find participants to sell to. This also limits the risk of a small number of large participants wielding undue influence in the market. However, the significant number of NZUs in the stockpile could also dampen the NZU price, if they were sold en masse, and lead to challenges in meeting emissions budgets.

However, the large volume of units currently in the stockpile may limit the effectiveness of many of the proposed options or cause a time lag before they start to take effect. This is because participants may use NZUs from the stockpile before changing their behaviour to reduce their emissions. In analysing the options, we have made the following assumptions about stockpile behaviour.

- We assume that participants will not sell stockpiled units into the market if they expect the NZU price to rise and they consider they may make a profit by selling in the future.
- We assume that participants will sell available units from the stockpile into the market if those holding NZUs do not expect the price to rise and result in a future profit.

The government has the option to reduce the stockpile by putting an expiry date on NZU vintages that fall within the time window when the very cheap international carbon credits were available. For example, the government could declare that all vintages prior to 2017 must be surrendered before the end of 2027, possibly with the exemption of forestry participants holding units for harvest liabilities. This would force those speculators who purchased units for arbitrage to realise their profit and allow the stockpile to reduce. This could be coordinated with auctions so that the volume available at auction each time is reduced by the amount of the stockpile the government wants to remove.

[40] The Treasury and Ministry for the Environment. 2023. *Ngā Kōrero Āhuarangi Me Te Ōhanga, the Climate Economic and Fiscal Assessment*. Wellington: The Treasury and Ministry for the Environment.

OPTION 1: USE EXISTING NZ ETS LEVERS TO STRENGTHEN INCENTIVES FOR NET EMISSIONS REDUCTIONS

Summary

The government could reduce the supply of NZUs, and therefore reduce net emissions, through existing levers such as auction volumes, price controls or industrial allocation.

Reducing the supply of NZUs available to the market is likely to increase the carbon price in the short term. This will create a greater incentive for emitters to reduce their gross emissions [not necessarily, because demand side NZETS participants can pass the carbon price onto their customers] and for others to increase their removal activities if they think this price will be sustained (eg, by investing in forestry). This effect is likely to be short-lived because the supply of removals would still be expected to rise in the medium term and is projected to be greater than the demand needed from emitters, even if auction volumes were zero (see chapter 3).

Reducing the volume of NZUs released by the government, which sets the overall NZ ETS cap, would effectively mean reducing our net emissions faster than required by our emissions budgets. Further net emissions reductions, especially in the short term, are likely to be considerably more costly to the economy.

How well will this option incentivise gross reductions and support additional removals?

Short-term increases to price will likely strengthen the incentives for net emissions reductions but only for those demand side NZETS participants whose profitability is impacted upon by the carbon price. This will be limited to those participants who cannot pass the carbon price onto their customers. However, the increased incentive for removal activities will likely dampen the price in the medium to long term, reducing the incentive for gross emissions reductions. This could be managed by restricting removal activities to permanent continuous cover forestry targeting erosion-prone landscapes that need such reforestation to reduce contingent liability risk to local rural economies from ex tropical cyclones.

The government should use existing levers AND increase incentives for gross emission reductions, AND reduce the expected volume of offshore mitigation, AND improve the removals facility by directing removals towards building climate resilient landscapes.

The government could use existing levers to reduce net emissions faster than required by our emissions budgets. A process is in place for regulating the supply settings in the NZ ETS (other than forestry) and updating them annually. Regulations specify:

- the number of units for release at auction and could be used as one of the mechanisms used to reduce the stockpile by imposing an expiry date on NZUs purchased prior to 2017.
- the number of units for release if the cost containment reserve is triggered. This could be used to ensure that the carbon price remains within the mid-range of the Climate Change Commission price path.
- the level of the cost containment reserve trigger price. This trigger price needs to be aligned with the Climate Change Commission price path and the Treasury Shadow Emission Prices.
- the auction reserve price.

The Minister, with advice from the Commission, can also recommend making regulations to change the current phase-out rates for freely allocated units to emissions-intensive and trade- exposed (EITE) activities.[41]

[41] Volumes and price control settings are given in regulations for five years ahead. There are restrictions on changes that can be made in each annual update. Regulations to accelerate phase-out of industrial allocations can only be made after detailed consideration by the Commission.

Currently, the statutory process for regulating the NZ ETS supply settings does not require consideration of gross emissions reductions or the supply of forestry units. We recommend that this is changed to impose gross emission reduction targets on demand side NZETS participants. This could be delivered by a cap-and-trade mechanism rather than the current 'trade-only' 'net-only' mechanism.

Option 1 would therefore involve amending the Climate Change Response Act 2002 to require the government (and, where appropriate, the Commission) to also consider the incentive for gross emissions reductions, or the supply of forestry units, before changing these regulations. This may result in reducing the number of units available at auction, increasing the levels at which price control mechanisms are triggered, and reducing the number of units freely allocated to some industrial firms. We support this.

Because a wide range of criteria need to be considered in exercising these functions, there is no guarantee that the outcomes would differ from the status quo. But such guarantees could be delivered by gross emission reduction targets using a cap-and-trade NZ ETS model. The government could still consider multiple criteria and decide to keep unit supply consistent with emissions budgets. This would be in line with the status quo.

If the government did decide to reduce the NZ ETS cap faster than the emissions budgets require, these changes could alter the NZ ETS price corridor (described in chapter 3) and drive up NZU prices, at least in the short term. Increases in price are also likely to drive further afforestation. But this increased afforestation could be controlled by directing it towards continuous cover forest on erosion-prone landscapes.

Several Māori and other stakeholders have proposed this option during previous government consultations.[42] However, it does not address concerns that the supply of forestry units under the status quo is projected to (more than) fully meet emitter demand for units. Without addressing this issue, the ability of this option to successfully deliver rising prices and gross emissions reductions beyond the short-term is likely to be limited. The limitations of this option were also raised by the Commission in its recently published draft advice on the policy direction of the second emissions reduction plan.[43]

[42] Such as the consultation in 2022 on Managing exotic afforestation incentives by changing the forestry settings in the NZ Emissions Trading Scheme. Retrieved 2 June 2023.

[43] Climate Change Commission. 2023. *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan*. Wellington: He Pou a Rangi | Climate Change Commission.

There are a number of ways to address this challenge:

- Eliminate offshore mitigation and reallocate the 100 million tonnes of offshore mitigation to a the domestic forest sector.
- Restrict removals activities to continuous cover forestry.
- Export any surplus mitigation under the Internationally Transferrable Mitigation Outcomes (ITMO) element of the Paris Agreement. This would be the same mechanism by which the government would import this mitigation. This export of surplus mitigation generates foreign exchange, whereas importing 100 million tonnes of carbon benefit from offshore will cost the taxpayer billions of dollars.

Currently, the number of units released to the market through auction and industrial allocation is designed to align with our emissions budgets. These budgets step towards the 2050 target in a way that is both ambitious and achievable, balancing the need for firms to transition to low- emissions practices with a need to keep overall costs to the economy manageable.

There is a risk that reducing unit supply beyond the levels required by the emissions budgets could lead to firms facing rapidly increased costs without providing enough time for them to transition to low-emissions

production. This is a particular risk in the short term and could lead to costs being passed on to the consumer or firms being forced to close. Costs are already passed onto the consumer. Firms have had carbon pricing on their radar for 20 years now. It is time to get on with maximising the incentives to transition away from dirty technology.

By contrast, when forestry units from current afforestation become available in the 2030s, they are projected to be sufficient to meet *all* surrender obligations. This can be controlled by changing the eligibility settings for forest sector removals and focusing only on activities that deliver significant co-benefits. Even reducing auction supply to zero is not projected to raise prices to the level needed to incentivise the switch to low-emissions production. Then use price control levers that will do this and remove the ability of NZETS demand side participants from avoiding impact on their profitability by passing the carbon price in a diluted form onto their price inelastic customers.

Expected impacts

Incentives for emissions reductions and removals

Option 1 is likely to increase prices in the short term – both at auction and on the secondary market – and incentivise participants to reduce gross emissions. It is unclear how participants who hold stockpiled units would behave under this scenario in the short term, despite the anticipated initial increase in prices. This is because the Commission's draft advice, as well as this document, outlines that this option would be ineffective in the medium to long term. The immediate increase in removal investments, in addition to the current supply of units projected to be delivered by forestry, is likely to dampen price increases in the long term, which may lead to stockpiled units being sold. This will lower the incentive to reduce gross emissions and make additional removal investments.

Contribution to Aotearoa New Zealand's nationally determined contribution

Under this option, the NZ ETS contribution to Aotearoa New Zealand's NDC is likely to reflect the same underlying trends expected for the incentives for emissions reductions and removals under the status quo.

If auction or industrial allocation volumes decrease, prices in the short term will be higher than they are under existing settings. This will result in more emissions reductions and will, in turn, increase the contribution that the NZ ETS can make towards Aotearoa New Zealand's current NDC.

However, as the higher price will also incentivise more removal activities in the short term, the price is likely to dampen over time. This will also lessen the incentive to reduce gross emissions in the medium and long term. This emissions price forecast could even undermine immediate interest in investing to reduce gross emissions. This means that, although this option could increase the contribution of the NZ ETS to future NDCs more than the status quo, the increase is not expected to be significant.

Functionality of the NZ ETS market

Under this option, the functionality of the NZ ETS does not change relative to the status quo. It does not add any complexity to the system, and the level of government control in the market remains the same.

Costs to economy and households

This option increases NZU prices in the short term and therefore the cost of emissions. These increased costs are likely to be passed on to consumers, especially in the transport and energy sectors. This is likely to disproportionally affect lower income households. Additionally, the lower NZU price, or reduced auction supply, will mean the government receives less revenue from NZ ETS auctions. This could limit the government's ability to use revenue from the auctions to mitigate the increased costs of the NZ ETS that are passed on to households or reduce the opportunities to fund other policies that reduce gross emissions.

If costs for surrender obligation become too high, some businesses may be forced to close or transition. This may have little impact at a national scale, but it could significantly affect local economies and employment.

However, industrial allocation and any other measures introduced in the future to address emissions leakage would be expected to mitigate these impacts.

Sectors involved in removal activities (such as forestry), that have available units to sell, will initially benefit from the higher emissions price. However, this may have flow-on effects, such as encouraging land-use conversion from pasture to forestry and may affect some rural communities. Over time, as emissions unit prices decrease, current and new removal investments may have lower economic returns.

Te Tiriti and Māori interests

Increases in NZU price will initially benefit Māori owners of existing forest in the NZ ETS, due to the increases in returns from carbon. This will provide particular benefit to those entered in the post-1989 permanent forest category, as well as to participants who have already afforested and registered under averaging accounting (because they no longer face surrender obligations when they harvest). Newly afforested areas may not see a great financial return due to the expectation that price will dampen in the medium to long term when the forest becomes established.

However, the increased NZU price and consequent increase in household costs are likely to impact on Māori households, which are disproportionately represented in lower income groups.

Co-benefits

No scope exists within this option to incentivise activities that have additional co-benefits. This is why another option is needed so that the NZ ETS setting can deliver such incentives. Such activities would require complementary policies, such as changes to the NZ ETS permanent forest category or development of a biodiversity credit system, to provide such an incentive. Improve the design of the NZ ETS forestry first, and then see if other options are needed. The biodiversity market is not yet established and would more likely be suitable for the voluntary carbon market anyway, given the need for the NZ ETS to focus on delivering our Paris Agreement target.

OPTION 2: CREATE INCREASED DEMAND FOR REMOVALS TO INCREASE NET GHG REDUCTIONS

Summary

Under option 2, additional entities will be able to purchase NZUs outside the NZ ETS (eg, the government or offshore buyers). The government could purchase NZUs to support achievement of the NDC, and offshore buyers might purchase them to meet voluntary emissions targets or support voluntary market claims.

There is currently no evidence of significant demand from offshore buyers because the removals they would be purchasing would still count towards Aotearoa New Zealand's NDC. But the government could also export any surplus removals through ITMOs.

This option would also give the government flexibility to reduce the availability of removal units to emitters. However, the government would still compete with other market participants and would be subject to the market price. This means the government would need to consider the price it pays to support purchasing removals or whether it is better invested in complementary policies to reduce emissions.

How well will this option incentivise gross reductions and support additional removals?

Any increase in demand will likely increase NZU prices, creating a greater incentive for emitters to reduce their gross emissions and increase their removal activities (eg, by investing in forestry). But this will only work for emitters who cannot just pass the cost of carbon onto their price inelastic customers. However, the increase in demand may be limited in practice (as purchase is unlikely to be attractive.) This option is only expected to be marginally more effective than the status quo.

We believe the government should use existing levers AND increase incentives for gross emission reductions, AND reduce the expected volume of offshore mitigation, AND improve the removals facility by directing removals towards building climate resilient landscapes.

Option 2 involves legislative or policy changes to increase the opportunities to sell NZUs allocated from removal activities. This option has been proposed by several stakeholders during previous consultations and engagements. In theory, this option will reduce the number of NZUs that emitters can access in the secondary market. These changes will incentivise gross emissions reductions, because increased demand in the secondary market will likely increase the NZU price. The increase in price is also likely to incentivise increased removal activities.

This option could be achieved in several ways, including by:

- enabling the Crown to be able to purchase NZUs on the secondary market.
- enabling NZUs allocated to removal activities to be sold to international carbon markets.

However, the effectiveness of this option will likely be limited. This is due to:

- the fact that the NZUs for purchase may not meet international standards (eg, providing assurance that the units purchased represent new and additional actions that result in permanent reductions or removals).
- countries wanting to use purchased units towards their NDCs, requiring units to be adjusted[44] to ensure the same removals are not counted twice.
- the uncertainty of demand for unadjusted units in voluntary carbon markets (VCMs). Information from our networks shows that buyers in the VCM typically think they are contributing to the NDC anyway. Indeed, all VCM participants who reduce their emissions are contributing to the NDC anyway, and no one

is asking for corresponding adjustments for this. During 2023, NZUs used for voluntary offsets are a contribution to the NDC already and our information indicates that no VCM participants have expressed concerns with this, even when informed that their offsetting actions encompass a contribution to the NDC.

The reason why voluntary offsetting using NZUs during 2023 is a contribution to the NDC is because there is now no facility for a Kyoto Cancellation Workflow on the NZ Emissions Trading Registry (NZETR). This Kyoto Cancellation Workflow involved converting NZUs to Assigned Amount Units (AAUS) and then cancelling the AAUs on the NZETR. The purpose of this was to prevent the voluntary carbon offsets also contributing to the NDC.

As such, having both emission reductions and removals in the VCM contributing to the NDC would very likely not reduce voluntary demand for participation in the VCM. The main thing is to ensure that VCM participants are aware of the carbon accounting outcome of their actions: i.e., that they are contributing to the NDC and not having a direct relationship with the atmosphere.

But as said, VCM participants have shown through 2023 that they are not sensitive to this issue. The only VCM participants that may be sensitive to this issue might be exporters whose buyers are demanding that their carbon offsets do not contribute to the New Zealand NDC. But those same buyers need to be informed that all of the emission reductions inside a net zero claim are a contribution to the New Zealand NDC anyway.

We note that MFE is grappling with this issue currently in its consideration of its guidance on the VCM.

[44] To avoid two countries counting the same emissions removals or reductions, sale of international units will require the selling nation to make a corresponding adjustment to its NDC accounting. This would mean the quantity of adjusted removals equivalent to the number sold internationally would not be able to be counted towards meeting NDCs. In effect, this would mean Aotearoa would need to achieve additional gross emissions reductions or removals to compensate.

In its draft advice on the second emissions reduction plan, the Commission raised similar concerns about this option.[45] The Commission does not consider this option a viable way to encourage further gross emissions reductions or support a sustainable rate of afforestation.

[45] The Treasury and Ministry for the Environment. 2023. *Ngā Kōrero Āhuarangi me te Ōhanga: Climate Economic and Fiscal Assessment*. Wellington: The Treasury and Ministry for the Environment.

This consultation assumes that the Government will not wish to units offshore if that means they cannot be used to meet Aotearoa New Zealand's NDCs because of its commitment to meet NDCs through domestic action as far as possible. We support this position. But we note that the government is already planning to buy 100 million tonnes of offshore mitigation and we believe that this needs to be eliminated or at least reduced as much as possible by focusing on both domestic emission reductions and more targeted domestic removals.

Selling units that cannot then be used towards Aotearoa New Zealand's NDCs would add further challenges to the ambitious targets that already exist. Based on current trends and policies, Aotearoa is likely to need to acquire a substantial net volume of offshore credits to meet the first NDC.[46] Future commitments are also likely to be challenging. Selling units offshore would be costly if the price at which removal units were sold were to be less than the cost of offshore units.

[46] The Treasury and Ministry for the Environment. 2023. *Ngā Kōrero Āhuarangi me te Ōhanga: Climate Economic and Fiscal Assessment*. Wellington: The Treasury and Ministry for the Environment.

Expected impacts

Incentives for emissions reductions and removals

This option is likely to incentivise marginally greater gross and net emissions reductions, compared with the status quo.

NZU prices and the demand for units are both expected to increase if the government or offshore buyers, or both, can purchase units. The expectation of an increasing NZU price is also likely to discourage participants from selling stockpiled units into the market. As the NZU price increases, more significant gross emissions reductions are likely, as is increased investment in removal activities. However, the effectiveness of this option will be determined by the number of NZUs the government or international buyers are willing to purchase and at what price.
Demand for these NZUs is not expected to be high.

Contribution to Aotearoa New Zealand's nationally determined contribution

This option could incentivise additional emissions reductions and increase the contribution of the NZ ETS to achieving Aotearoa New Zealand's first nationally determined contribution. It could also incentivise additional afforestation, but these would contribute to subsequent NDCs.

This analysis assumes that any NZUs sold offshore are still counted towards Aotearoa
New Zealand's NDCs and do not include a corresponding adjustment to the NDC. However, demand for units that cannot be counted towards a country's NDC is not anticipated to be high, which would limit the effectiveness of this option.

Additionally, the government purchasing NZUs may be costly and inefficient. This option works by increasing demand for NZUs, on the assumption that this will lead to higher prices both at auction and on the secondary market, and therefore a greater incentive for gross emissions reductions. The government would simultaneously be competing with emitters to purchase NZUs at this higher price on the secondary market; this is likely to be costly for the taxpayer.

Given the lag between trees being planted and starting to remove carbon from the atmosphere, this purchase of NZUs allocated for removal activities would not incentivise any additional removals in the short term. It therefore functions as a wealth transfer from the public to foresters, with no public benefit.

Overall, this option is expected to marginally benefit Aotearoa over the status quo, provided domestic abatement is more cost effective than purchasing units offshore.

Functionality of the NZ ETS market

Under this option, only be minor changes would be made to the functionality of the NZ ETS. No change would be made to the operation and complexity of the market for participants. However, this option creates more complexity for the government if it purchases units, and an even greater level of complexity if units are sold to offshore buyers. Opening the market to international buyers will require the government to establish a process for implementing international sales, as well as managing the entities or countries that would be eligible to purchase these units.

If the government was to purchase units on the secondary market, it would have more influence in the market than it currently does. The government could influence the price in the market through the volumes of units it is willing to purchase, and through the price paid for these units.

Costs to economy and households

This option increases NZU prices and therefore the cost of emissions. These increased costs are likely to be passed on to consumers, especially in the transport and energy sectors. This is likely to disproportionally affect lower income households. While the government will likely earn more revenue from the sale of NZUs at auction, this additional revenue may need to be used to purchase removal units on the secondary market.

If costs for surrender obligation become too high, some businesses may be forced to close or transition. Although this may have little impact at a national scale, it could significantly affect local economies and employment. Industrial allocation provides a lever for the government to manage the impacts on emissions-intensive and trade-exposed firms.

Sectors involved in removal activities (such as forestry) will benefit from the higher emissions price. However, this may have flow-on effects, such as encouraging land-use conversion from pasture to forestry and may impact on some rural communities.

Te Tiriti and Māori interests

Increases in NZU price (if sustained) will likely benefit Māori forest owners and the owners of land that is suitable for afforestation, due to the increases in returns from carbon. Opening the removals market to a wider range of buyers is also likely to provide more investment certainty within the sector.

However, the increased NZU price and consequent increase in household costs are likely to impact on Māori households, which are disproportionately represented in lower income groups.

Co-benefits

This option could incentivise removals, which provide additional biodiversity, environmental, social or cultural co-benefits. The government could offer a higher purchase price for units that are allocated for removal activities and that have multiple co-benefits (eg, units generated from permanent indigenous forests). Likewise, international buyers who are purchasing units for the purpose of making corporate claims are more likely to buy units that have multiple co- benefits.

OPTION 3: STRENGTHEN INCENTIVES FOR GROSS GHG REDUCTIONS BY CHANGING REMOVAL INCENTIVES

Summary

Option 3 will create two prices: one for emissions reduction activities and another for removal activities. A lower price will apply to removal activities, making them less financially attractive. The prices for reductions and removals would still be linked, because an increase to the price for units sold at auction will likely increase the price paid for removal activities.

This option could also allow the government to tailor the support it provides for specific removals activities (eg, enabling it to incentivise indigenous or permanent forestry over exotic forestry).

How well will this option incentivise gross reductions and support additional removals?

The degree to which this option drives gross reductions will depend on the restrictions imposed (eg, on the proportion of units allocated from removal activities that can be used for surrender obligations) and the impact these restrictions have on the price of NZUs. The restrictions imposed by this option could change with time, to ensure it is still effective in delivering the desired balance of gross and net emissions reductions as Aotearoa New Zealand moves towards the 2050 net-zero target.

Without additional measures to encourage more removals, this option is likely to result in less removal activity.

Option 3 will create different prices for units sold at auction and those allocated from removal activities.

This option either increases the relative price for units sold at auction by decreasing the demand for removal activities or decreases the price for units allocated from certain removal activities. Three examples of how this could be achieved are outlined below. The examples are not intended as an exhaustive list and this option could be implemented in many ways.

- **Impose restrictions or conditions on the units that NZ ETS participants can surrender as part of the surrender obligations generated through removal activities.** This could involve a limit on the proportion of units allocated from removal activities that can be used for surrender obligations. This is the model used in the Californian ETS, where emitters are only permitted to use offsets to meet a portion (currently 4 per cent, increasing to 6 per cent from 2026) of their obligation.
- **Restrict the number of units that can be allocated from removal activities.** This could involve certain removal activities (eg, sequestration from exotic pine forests) being allocated a reduced number of units relative to the actual amount of CO_2 they have sequestered (eg, 1 NZU for 2 tonnes of CO_2).
- **Restrict the time removal units can be held to be used as part of an emitter's surrender obligation.** This option is also known as vintaging.

Vintaging New Zealand Units allocated for emissions removals

Vintaging would put on expiry date on units being held by participants in the NZ ETS stockpile.

For example, a time limit of 10 years could be placed on NZUs allocated from removal activities. After this time, they would not be able to be used to meet surrender obligations.

Vintaging removal units would likely reduce their value in the secondary market and place more demand for units sold at auction.

A time limit could also be applied to units sold at auction, received for industrial allocation, or that are already in the stockpile (including those sourced internationally). However, the expected effects of a time limit being applied to all NZUs are not described in this chapter.

Vintaging could be used either as a stand-alone option or alongside the other options described in this chapter.

Expected impacts

Incentives for emissions reductions and removals

Reducing the supply of units available for surrender obligations is expected to incentivise greater gross emissions reductions. This reduced supply will likely increase the NZU price faced by emitters.

The success of this option will depend on the restrictions the government imposes and whether they are sufficient to drive gross emissions reductions. For example, the impacts of allowing a participant to limit removal units to 50 per cent of their surrender obligations will have a different impact if the restriction of removal units was 90 per cent. However, the range of outcomes from different restrictions has not yet been assessed. Subject to feedback on this consultation, further work will be undertaken to provide detailed analysis of how the options could be implemented and the impacts their implementation may have.

The stockpile behaviour will also be dependent on the restrictions imposed. For example, if restrictions are only imposed on newly allocated forestry units, then participants are likely to hold their stockpiled units because their value is expected to increase over time. If restrictions are applied to all units, then it is anticipated that stockpiled units will be sold into the market and likely to delay the effectiveness of this option.

In the absence of additional policy interventions, this option is likely to decrease demand for units allocated for removal activities and therefore reduce the incentive to invest in additional removal activities.

Contribution to Aotearoa New Zealand's nationally determined contribution

This option is not expected to increase the NZ ETS contribution to Aotearoa New Zealand's NDC. Although this option is likely to increase the proportion of gross reductions, these gains will be counterbalanced by the reduced incentives for removal activities.

This risk could be mitigated by introducing additional policy interventions to encourage removal activities (eg, if the government also purchased NZUs from removal activities). In this event, the NZ ETS is likely to make a greater contribution to the NDCs.

unctionality of the NZ ETS market

Although the legislative or structural change to the NZ ETS required for this option will be relatively low, this option imposes a large degree of change to the current operation of the NZ ETS. Those participants with surrender obligations are unlikely to face increased complexity, other than an increase in price. However, those participants undertaking removal activities would be affected, depending on how the option is implemented.

Changing the number of units allocated for forestry activities to differ from the amount of carbon dioxide (CO_2) being removed (eg, 1 NZU for 2 tonnes of CO_2) represents a fundamental shift in the integrity of forestry units. This may have implications for future opportunities to link the NZ ETS with offshore markets. It also raises issues of equity and fairness if a forester faces surrender obligations for harvest or deforestation.

This option introduces considerably more government control into the market. The government will be able to adjust the value of removal activities relative to reduction activities by changing the restrictions imposed on removal activities. This will create volatility in the market for participants who are conducting removal activities.

Costs to economy and households

This option increases NZU prices and therefore the cost of emissions. These increased costs are likely to be passed on to consumers, especially in the transport and energy sectors. This is likely to disproportionally affect lower income households. However, this assumes there is no change in behaviour from households in response higher carbon prices, which would reduce household costs.

If costs for surrender obligations become too high, some businesses may be forced to close or transition. Although this may have little impact at a national scale, it could significantly affect local economies and employment.[47] However, the increased NZU price would likely result in the government earning more revenue from NZ ETS auctions. This increased revenue could be used to mitigate the increased costs likely to face households or to support high emitting industries to transition to low-emissions technologies.

Sectors involved in removal activities, such as forestry, will also be disadvantaged by this option unless complementary measures for removals are introduced. This option would result in two effective prices for units, because those bought at auction will be more valuable and in higher demand than those allocated for removal activities.

Te Tiriti and Māori interests

This option will adversely affect Māori forest owners or those who own land that is suitable for afforestation.

Without complementary policy interventions, this option does not incentivise greater climate ambition relative to the status quo.

The increased NZU price and consequent increase in household costs are likely to impact on Māori households, who are disproportionately represented in lower income groups.

Co-benefits

This option would allow the government to tailor its support for specific removal activities differently. For example, restrictions may not apply to removal units allocated for indigenous forestry, permanent forestry, or the export or destruction of synthetic greenhouse gases.

[47] Industrial allocation provides a lever for the government to manage the impacts on emissions-intensive and trade-exposed firms.

OPTION 4: CREATE SEPARATE INCENTIVES FOR GROSS EMISSIONS REDUCTIONS AND EMISSIONS REMOVALS

Summary

Option 4 would create two markets with two separate prices: one for gross emissions reduction activities and another for removal activities.

Emitters would only be permitted to use units sold at auction or allocated for emissions- intensive and trade-exposed activities to meet their surrender obligations, while removal activities would be incentivised through a separate market. An important design choice for this market would be who purchases these removals: the government or emitters (or both).

The price paid by for removal activities, and the price paid for units at auction or on the secondary market, would not be linked.

How well will this option incentivise gross reductions and support additional removals?

Because emitters could not use removals to meet their mandatory surrender obligations, the government would be able to control the incentive to reduce gross emissions through unit supply settings. As a result, the government could encourage emitters to reduce their gross emissions more than the status quo.

A separate market would incentivise removal activities. The extent removals are incentivised would depend on the design of this new mechanism and the price assigned to and paid for removals. The degree of investment certainty for removal activities would depend on the design of and confidence in this new market.

Under option 4, emitters would no longer be able to use units allocated for removal activities ('removal units') to meet their surrender obligation for their gross emissions. Only units sold at auction or allocated for EITE activities ('gross units') could be used to meet surrender obligations.

The government would use NZ ETS unit supply settings to reduce the supply of gross units to the market over time. This would incentivise a desired level of gross emissions reductions from emitters. To provide clarity for market participants, the government would need to set out its desired balance of gross reductions and removals towards achievement of emissions budgets and use this to guide supply settings decisions. This aligns with the Commission's draft advice for the second emissions reduction plan.

To provide an ongoing incentive for removal activities, a separate removals market would be established in which removal units could be bought and sold. This market could use the same infrastructure (such as category definitions, liabilities and accounting approaches) that underpins NZ ETS forestry today.

This is similar to how the European Union ETS and United Kingdom ETS operate: emitters cannot access removals to offset their emissions, and removals are incentivised through complementary policy interventions.

An important design question for the removals market is who would purchase removals units. This would involve one or a combination of the following.

- **The government could directly purchase removals:** this would contribute to achievement of emissions budgets and the NDC. This could be delivered through:
  - a reverse auction (the government purchases a predetermined volume of removals at the cheapest price available from the market)
  - a fixed price option (the government buys as many removals as the market is able to provide at a fixed price per tonne of carbon dioxide removed)
  - another design.
- **Private entities on a mandatory basis:** the government could create a new obligation on emitters to purchase removals to contribute to achievement of emissions budgets and the NDC. For example, the government could require emitters to surrender a number of removals in addition to gross units covering their gross emissions.[48]
- **Private entities on a voluntary basis:** the government could allow voluntary participation in this new market, for example, by companies seeking to buy removals, to support a contribution claim towards Aotearoa New Zealand's NDC.

By purchasing removals, the government could complement other work programmes. For example, government agencies could purchase removal units to meet their obligations under the Carbon Neutral Government Programme (CNGP). Alternatively, the Crown could choose to incentivise removal activities that have additional co-benefits by offering a different price for different activities.[49]

Like other options, another important design decision relates to whether a new restriction on use of removal units applies to units currently held in the stockpile and, if so, whether and how units in the stockpile could be categorised as a gross unit versus a removal unit.

This option would involve separate incentives for gross emissions reductions and removals. Removals could not be used for surrender obligations for gross emissions, and gross units could not be traded on the removals market.

Expected impacts

Incentives for emissions reductions and removals

Option 4 gives the government control over the reductions incentive facing emitters because participants can only use units sold at auction or received through industrial allocation to meet their surrender obligations. The government can use this control to provide a stronger incentive for gross emissions reductions than the status quo.

The incentive for removals will depend on:

- the price that is paid for units allocated from removal activities
- the number of units the government chooses to release back into the market as part of the auction volumes, if it were to purchase units allocated for removal activities.

As in option 3, the behaviour of participants who have stockpiled units will likely depend on whether the changes apply only to newly allocated units from removal activities or also to those allocated prior to this option coming into effect. The government would need to assess whether and how units in the stockpile could be classified as gross units or removals units.

[48] For example, NZ ETS participants might be required to surrender removals equal to 10 per cent of their total gross emissions liability. In this scenario, a participant with a gross emissions liability of 1,000 units would have to surrender 1,000 gross units, as well as 100 removals units. In this model, the government would need to consider the overall cost impact on emitters from the two obligations.

[49] The government could, for example, offer to pay a higher price for removals from indigenous forests than exotic forests, to promote biodiversity outcomes.

If restrictions on the use of removals apply only to newly allocated units, participants who hold stockpiled units will be more likely to hold onto them because the price of the units is expected to increase with time. If restrictions are applied to all units, regardless of allocation date, participants who hold units allocated from removal activities would be more likely to sell them into the market, leading to a further dampening of the price expected for units allocated for removal activities.

This option is expected to take the longest to design and implement, given the scale of change to the design of the NZ ETS. This may limit its effectiveness in the short term. However, clearly communicating how we would transition to this option could create a market signal that drives some behaviour change before it is fully implemented.

Contribution to Aotearoa New Zealand's nationally determined contribution

This option incentivises emissions reductions and removal activities independently and can therefore increase the NZ ETS contribution to our current and future nationally determined contributions.

Functionality of the NZ ETS market

This option involves the most comprehensive changes to the NZ ETS, because it creates two separate markets. Compared with the status quo, this option gives the government much greater control of the price faced both by emitters and those undertaking removal activities. Structurally, this would likely require big changes to the implementation of the NZ ETS. These could be costly and take several years to implement.

Costs to economy and households

This option would be used by government to increase NZU prices and therefore the cost of emissions. These increased costs are likely to be passed on to consumers, especially in the transport and energy sectors. This is likely to disproportionally affect lower income households. Like option 3, the increased NZU price and increased auction volumes would likely result in the government earning more revenue from NZ ETS auctions. While some of this revenue may be needed to support removal activities, the government will have an opportunity to earn further revenue if any of these purchased removal units are released as part of auction volumes. This, however, assumes that the price paid for NZUs at auction will be higher than the price the government purchases removal units for.

Te Tiriti and Māori interests

Although it is unclear how investors in removal activities (such as forestry) will initially respond to this change, in the long term, it could provide more investment certainty for foresters than the status quo (depending on the design and purchase behaviour). This would likely benefit Māori forest owners or the owners of land suitable for afforestation.

However, the increased NZU price and consequent increase in household costs are likely to impact on Māori households, which are disproportionately represented in lower income groups.

Co-benefits

Removal units that provide additional biodiversity, environmental, social or cultural co--benefits could be incentivised under this option. For example, if the government were to purchase units allocated from removal activities, the government could offer a higher purchase price for units that have multiple co-benefits (eg, units generated from permanent indigenous forests or forests grown on Māori land).

COMPARISON OF OPTIONS IN ACHIEVING THE OBJECTIVES

Table 6 provides a high-level summary of how effectively options 1 to 4 will achieve the objectives outlined in chapter 5, compared with the status quo.

For simplicity, table 6 does not include the considerations in chapter 5, including the time needed for implementation, the complexity of the required change(s) and the costs to the economy and households. Detailed analysis of the key considerations will be undertaken as part of the next stage of the review.

Table 6: High-level summary on how the options reduce gross emissions reductions and maintain support for removals

	Options	Prioritises gross emissions reductions	Maintains support for removals
Degree of change required to the New Zealand Emissions Trading Scheme ↓	Option 1: Use existing NZ ETS levers to strengthen incentives for net emissions reductions	**Low** Anticipate a short-term reduction in gross emissions due to price increases. However, the increased incentive for forestry removals will likely dampen the price in the medium to long term and reduce the incentive for gross emissions reductions.	**Low–Medium** Short term price increases are expected to drive additional afforestation. This will increase unit supply in the medium to long term, which will likely dampen the unit price and reduce this increase in incentive.
	Option 2: Create increased demand for removal activities to increase net emissions reductions	**Low–Medium** Increased demand may increase New Zealand Unit (NZU) prices, creating a greater incentive for emitters to reduce their gross emissions.	**Low–Medium** Increased NZU prices will likely increase the incentive for additional removal activities.
	Option 3: Strengthen incentives for gross emissions reductions by changing the incentives for removals	**Medium–High** The changed incentives for removal activities are expected to increase the incentive for gross emissions reductions.	**Low** Without additional measures to encourage more removals, this option is likely to result in less removal activity.
	Option 4: Create separate incentives for gross emissions reductions and emissions removals	**High** Limiting the number of units participants can use for their surrender obligations will likely increase the NZU price as a result and encourage emitters to reduce their gross emissions.	**Medium–High** Additional removal activities are expected to be incentivised. How far removals are incentivised would depend on the price assigned to and paid for units allocated from removal activities.

Key: **Low**, **Medium** and **High** are qualitative assessments on how each option will achieve the objective relative to the status quo; **Low** = small improvement (only marginally better than the status quo); **Medium** = provides a level of improvement likely to have a quantifiable impact; **High** = significant improvement (and most likely to achieve the objective).

One option is not being progressed

This review has identified several options to prioritise gross emissions reductions in the NZ ETS, while continuing to support removal activities.

The four options outlined above meet either some or all the Government's policy objectives.

One other option was also identified, but it was not progressed because it would not meet the desired policy objectives outlined in chapter 5. This option is briefly described below.

Removal activities are removed from the NZ ETS, and no alternative mechanism to incentivise removal activities is provided

The option of excluding removal activities from the NZ ETS, without an alternative incentive mechanism, was considered and dismissed. This is because removal activities are critical to meeting Aotearoa New Zealand's emissions reduction targets and will continue to play an important role in future targets.

The social and environmental effects of land-use conversion to permanent exotic forests are not being considered as part of the NZ ETS review. However, the types of forestry, their location and management are being considered under proposed changes to the National Environmental Standards for Plantation Forestry and the current consultation on proposals for redesigning the permanent forest category in the NZ ETS.

CONSULTATION QUESTIONS

Chapter 6 Consultation questions	
6.1	Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?
6.2	Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.
6.3	Of the four options proposed, which one do you prefer? Why?
6.4	Are there any additional options that you believe the review should consider? Why?
6.5	Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?
6.6	Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

We consider this set of options to not provide a coherent option framework for improving the NZETS. The government should define a clearer vision of the role of the NZETS in transforming the economy to deliver our Paris Agreement obligations and avoid dangerous climate change. The government can then use existing levers AND increase incentives for gross emission reductions, AND reduce the expected volume of offshore mitigation, AND improve the removals facility by directing removals towards building climate resilient landscapes – all in the service of this overarching, nation-building vision.

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

We believe the options have been assessed outside the rubric of an integrated visionary approach to the climate change problem. We see useful elements in a number of the options as indicated above. As such, we do not see these options as exclusive to each other.

6.3 Of the four options proposed, which one do you prefer? Why?

We prefer an integrated approach that includes elements of Options 1 and 3.

Option	Remarks
1. Use existing NZ ETS levers to strengthen incentives for net emissions reductions.	Exhaust all options here before building new legislation and regulation. This can include the following: • Change the NZETS to a cap-and-trade system through an amendment to the legislation. • Stabilise the carbon price by making a commitment to NZU price controls that align the NZU price with the Climate Change Commission's carbon price path. • Keep exotics in the permanent forest category of the NZ ETS. • Define the permanent forest category of the NZ ETS as continuous cover forestry. • Impose continuous cover forest management requirements on registrants in the permanent forest category. • Remove residuals liability for second rotation forests entered into the NZ ETS for the first time. • Direct the supply of forestry NZUs to those landscapes that need reforesting (particularly permanent forest) for climate change resilience.
2. Create increased demand for removal activities to increase net emissions reductions.	This option seems to miss the point of the need to reduce gross emissions from sources domestically and align this with a directed approach to removals to enable the greatest co-benefits to be delivered at least cost. Such an approach would increase the carbon price in the domestic NZ ETS but under current settings such higher prices can (predominantly) be passed onto the customers of the emitters, thereby reducing the impact of the carbon price on institutional investors supporting the emitter community.
3. Strengthen incentives for gross emissions reductions by change the incentives for removals.	Changing incentives for removals is not the only option for strengthening incentives for gross emissions reductions. It is more important to shift climate change mitigation strategy towards more directly exposing emitters and their investors to the impact of the carbon price. This will impact on their profitability and drive investment into clean development and clean technology. One way to deliver this is to use a national marginal abatement cost curve to identify those sectors and activities that are high fruit on the abatement tree and allocate removal offsetting to those activities. Then the cap-and-trade element of the NZ ETS can focus on the low and medium fruit on the abatement tree by imposing gross emission reduction targets on those low and medium fruit. At the same time, the government could point the firehose of forest carbon money towards the landscapes that desperately need to be reforested for climate change resilience. This can include clear-cut forestry on lowest slopes, continuous cover (exotic and/or indigenous)

		forestry on mid slopes and non-extractive indigenous forestry on the steepest slopes.
4.	**Create separate incentives for gross emissions reductions and emissions removals.**	We have the opportunity to tune the existing instrument of the NZETS in the way described in this submission. Changing to two instruments will come at a high transaction cost and we believe should only be contemplated as a complementary measure to a redesigned NZ ETS.

6.4 Are there any additional options that you believe the review should consider? Why?

-

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

-

6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

Yes. We are greatly concerned about the potential impacts on Māori as identified in the content of our submission above (particularly our response to Chapter 4).

Chapter 7: Broader environmental outcomes and removal activities

Chapter 6 outlines and assesses four options for driving greater gross emissions reductions through the NZ ETS, while maintaining support for removals.

This chapter looks at incentivising removals more broadly and considers whether the NZ ETS should be used to:

- strengthen incentives for removal activities that have broader environmental outcomes
- or co-benefits beyond sequestration (eg, indigenous afforestation can enhance indigenous biodiversity)
- include additional removal activities in the NZ ETS, such as blue carbon and the restoration of wetlands.

These issues are considered together because they are related. Some removal activities that have co-benefits can already be entered into the NZ ETS, but the incentives available are not enough to make them widely attractive. In other cases, activities are not included in the NZ ETS and – even if they were – the relative incentives might not be enough.

This chapter also summarises other work programmes that are underway to encourage a broader range of removal activities and realise the associated co-benefits.

Removals activities have a range of benefits beyond removing carbon from the atmosphere

- Indigenous afforestation, which can help to improve indigenous biodiversity.
- Restoring coastal wetland ecosystems would sequester carbon while increasing biodiversity. Restored coastal wetlands could also play an important role in improving resilience to adverse weather events, by absorbing flood waters and reducing heat stress

CHANGES TO THE NZ ETS COULD ENCOURAGE MORE REMOVAL ACTIVITIES

Work is underway to increase indigenous forestry and improve our understanding of carbon storage

The current reward structure of the NZ ETS provides a greater incentive for removals from fast- growing exotic species, such as pine, rather than slower growing indigenous species. However, the Government has indicated support for indigenous forestry and has several work programmes underway to incentivise indigenous afforestation. Workstreams that would increase the incentive within the NZ ETS include work to redesign the NZ ETS permanent forest category. The Maximising Forest Carbon Programme will undertake research into how carbon storage can be better measured.

We note that there is currently no barrier to undertaking continuous cover forestry under the Permanent Forest Category of the NZETS. We recommend that the Permanent Forest Category be redefined as being synonymous with continuous cover forestry with management requirements on all registrants to this category.

Redesign of the New Zealand Emissions Trading Scheme Permanent Forestry Category

In 2022, the Government consulted on proposals to restrict exotic forest species in the permanent forest category of the NZ ETS. Following feedback from stakeholders and Māori, Ministers agreed to redesign the category to target their preferred outcomes, including:

- better addressing the long-term environmental impacts of poorly or unmanaged permanent forests
- managing the impacts on rural communities
- increasing the incentive for indigenous forests.

The Government is currently consulting on the detail of these changes with the intent that a redesigned category will come into effect from 2025.

Maximising Forest Carbon Programme

The Maximising Forest Carbon Programme will run from 2022 to 2026. It will undertake extensive research into carbon storage in different forest types and how carbon storage can be better measured, including the use of remote sensing technology. The Programme will:

- improve the way we measure forest carbon in the NZ ETS, including:
  - an updated suite of the default carbon tables used by smaller NZ ETS participants to calculate their carbon storage and unit entitlements, including additional tables for indigenous species to more accurately recognise carbon storage in these forests
  - updated methodologies to determine participant-specific yield tables used by larger NZ ETS participants
- consider how good forest management practices resulting in additional carbon storage can be measured, recognised and incentivised, particularly in pre-1990 forests
- consider how climate change will impact on carbon storage in our forests in the future and what interventions may be needed in the short term to mitigate or manage these impacts.

Options identified through the NZ ETS review could further incentivise removal activities with co-benefits

Chapter 6 outlined four options to amend the NZ ETS and assessed their ability to improve the incentive for removals with co-benefits. Table 7 summarises these design opportunities.

Table 7: Opportunities to incentivise removals under different options

Option		Opportunities to incentivise removals with co-benefits
1	**Use existing NZ ETS levers to strengthen incentives for net emissions reductions**	No opportunities are available under option 1.

2	**Create increased demand for removal activities to increase net emissions reductions**	Under option 2, the Government could offer a higher price for removal activities that provide co-benefits, such as biodiverse, indigenous forests. There is also likely to be greater demand in overseas carbon markets for NZUs from removal activities that provide multiple benefits. Our experience is that compliance buyers in the NZETS will not voluntarily pay higher prices for a premium NZU product. If higher prices are to be proposed, we recommend the following be included: 1. Changes on the demand side of the domestic NZETS such as a requirement that a certain proportion of NZUs surrendered to the government are from a higher priced (e.g., indigenous) units. 2. Differentiating these units upon issuance (e.g., a new unit type). 3. A decision on what counts as valid co-benefits. We recommend the primary co-benefit be climate resilience and biodiversity a secondary co-benefit. This is because climate resilience is a 'must-have' in relation to a national climate change response. Moreover, continuous cover exotic forestry can deliver the ecological infrastructure necessary for climate resilience due to the absence of clear felling whilst also maintaining rural land value. 4. A decision on the price point for indigenous reforestation projects to be financially self-sustaining. Our calculations show that this minimum price would be around $170/tCO2e and rising in real terms at $4.75 annually across a 30-year cash flow. 5. A decision to allocate a taxpayer subsidy to fund the government purchase of such units at prices capable of sustaining such projects.

Option		Opportunities to incentivise removals with co-benefits
3	**Strengthen incentives for gross emissions reductions by changing the incentives for removals**	In option 3, the government could look to strengthen the incentives for specific removal activities that offer co-benefits, by allowing emitters to meet their NZ ETS obligations with units from these activities. One way to do this is to allow exotic species to remain in the permanent category of the NZETS but with management requirements to safeguard against "plant and leave" carbon forestry.
4	**Create separate incentives for gross emissions reductions and emissions removals**	In option 4, the government could buy removals from indigenous forests at a premium price, or there could be a requirement for emitters to purchase and surrender units from indigenous forests. We prefer an integrated approach that delivers both our Paris Agreement and a key element of rural climate resilience at a low cost to the taxpayer. If the government purchased indigenous carbon credits at a higher price there would likely need to be a taxpayer subsidy that will ultimately involve a fiscal trade-off that will have political implications. An option capable of being delivered at low cost to the taxpayer could be delivered in Option 3 by requiring management rules for registrants in the Permanent Forest category.

The extent to which options 2, 3 and 4 can incentivise indigenous afforestation will largely depend on the price incentive that is offered. As mentioned above, our calculations show that a financially viable indigenous reforestation carbon project will require a starting carbon price of $170 and then rising annually at an average rate of $4.75 per year across a 30-year cash flow (see Weaver 2022. Investment barriers to indigenous forest climate solutions).

Indigenous afforestation is unlikely to be profitable at a $70 carbon price. Under some scenarios, even an NZU price of greater than $100 does not result in a profit for indigenous forests in the NZ ETS.[50] Enabling investment in indigenous forests to be profitable as well as comparable in profitability to exotic forests will likely require further supporting policy beyond the NZ ETS.

Further work will be undertaken to refine and analyse these options, in light of the feedback we receive during this consultation. This phase of work is also likely to examine the incentives for different forest types in more detail, including those that apply to indigenous afforestation.

There is already commercial experience in the permanent forest sector that shows that continuous cover exotic forestry and continuous cover exotic forestry transitioning to indigenous forest can be financially viable provided there is some price stability in the NZTS without changing from the Climate Change Commission recommended price path, or the mid-range of the Treasury Shadow Emission Prices.

The most useful thing to stimulate and incentivize a removals solution to the "plant and leave" exotic carbon forestry approach is to:

- Keep exotic species in the Permanent Forest category of the NZETS.
- Require registrants in the Permanent Forest category to adhere to continuous cover forest management rules.
- Maintain carbon price stability by adhering to the Climate Change Commission recommended price path.
- Remove the residuals liability for new NZETS indigenous reforestation being planted after a non-NZETS post-1989 exotic forest has been harvested. At present this residuals liability creates a prohibitive cost barrier to landowners seeking to change forest type when entering the NZETS for the first time. We note also that the landowner in these situations did not gain any carbon credit benefits from the post-1989 exotic forest that was not registered in the NZETS, but the government did through the national inventory. The carbon gains received by the government (but not the forest owner) from the post-1989 exotic plantation are more than enough to cover the residuals liability currently imposed upon new indigenous forest registered in the NZETS in situations like this.

Changes to the NZ ETS could help to achieve a specific balance of exotic and indigenous afforestation

The Commission's advice on the first emissions reduction plan included a recommended level of indigenous and exotic afforestation.[51] While the Government has strongly indicated its support for increasing the levels of indigenous afforestation, it has not decided on a preferred proportion of indigenous and exotic afforestation. As a result, the options outlined above do not indicate the type of forest, or removal activity, that should be prioritised.

As the NZ ETS review and the other work programmes progress, the government will better understand the benefits and costs of incentivising indigenous forests and other removals. It will then be able to assess and determine whether a specific target for indigenous afforestation will best serve to meet our emissions budgets and NDCs.

If exotic forests can remain in the permanent category of the NZETS (with management requirements), and if we have carbon price stability, then no specific additional financial incentives are required to enable the activities presented in Table iv.

Table iv. Recommendations for forest management categories in the permanent forest category of the NZETS.

Forest Management Activity	Short term forest state	Long term forest state
Exotic continuous cover forestry in perpetuity.	Exotic forest	Continuous cover exotic forest with sustainable forest management harvesting in perpetuity
Exotic continuous cover forestry transitioning to indigenous continuous cover productive forestry.	Exotic forest	Productive indigenous forest with sustainable forest management harvesting in perpetuity
Exotic continuous cover forestry transitioning to indigenous protection forest (no indigenous harvesting – e.g., on steepest slopes).	Exotic forest	Non-productive protected indigenous forest managed for conservation.
Indigenous continuous cover productive forestry funded by being integrated into a business model that includes exotic continuous cover forestry.	Indigenous forest financially dependent on exotic forest	Productive indigenous forest with sustainable forest management harvesting in perpetuity
Indigenous protection forest funded by being integrated into a business model that includes exotic continuous cover forestry.	Indigenous forest financially dependent on exotic forest	Non-productive protected indigenous forest managed for conservation.

Our view is that the key questions are:

1. What is broken that needs fixing?
2. How complex and expensive is the solution?
3. Is the solution politically expedient?

We present what we see as the core problem and potential solutions in Table v.

Table v. Problem and recommended solutions to policy for stimulating continuous cover forestry in the permanent category of the NZETS.

Problem	Solution	Recommendation
Uncertainty in the market about whether exotic species can be used in the permanent forest category of the NZETS.	Allow non-wilding exotic species to be used in the permanent forest category of the NZETS.	Impose continuous cover management requirements on registrants in the permanent forest category of the NZETS.
Uncertainty about the future carbon price pathway.	A government commitment to maintaining carbon prices in alignment with the Climate Change Commission's recommended carbon price pathway.	Amend the legislation to impose NZETS carbon price controls to align the price with the Climate Change Commission's recommended carbon price pathway.

Uncertainty about geographic constraints on carbon forestry.	Government deciding where (geographically) it wants to point a firehose of carbon money.	Add geographic elements to the eligibility criteria for the permanent forest category of the NZETS steering it towards marginal and erosion prone landscapes.

Summary of Recommendations on Removals Strategy

- Focus removals on emissions that are impossible or prohibitively expensive to reduce/abate.
- Removals that contribute to delivering the Paris Agreement at least cost to the taxpayer and that can therefore be delivered without taxpayer subsidy.
- Maximising climate resilience and biodiversity co-benefits to enable these co-benefits to be delivered at least cost to the taxpayer.
- Use the Permanent Forest category of the NZETS to help build climate resilient rural landscapes and recognise permanent forests as 'ecological infrastructure' capable of reducing contingent liability risk associated with extreme weather events. This can then enable government policy to recognise the value of carbon financed permanent forests as a core element of a national climate change adaptation strategy that can be delivered at low cost to the taxpayer.
- Focus NZETS permanent forest on lands unsuitable for agriculture unless the farmer wishes to retire agricultural lands for permanent forestry.
- Define 'permanent forest' as 'managed continuous cover forestry' that includes the following:
    - Exotic continuous cover forestry in perpetuity (i.e., remaining exotic forest).
    - Exotic continuous cover forestry transitioning to indigenous continuous cover productive forestry.
    - Exotic continuous cover forestry transitioning to indigenous protection forest (no indigenous harvesting – e.g., on steepest slopes).
    - Indigenous continuous cover productive forestry funded by being integrated into a business model that includes exotic continuous cover forestry.
    - Indigenous protection forest funded by being integrated into a business model that includes exotic continuous cover forestry.
- Allow exotic species in the Permanent Forest category of the NZETS.
- Require management rules for registrants in the Permanent Forest category (including native forests) to create necessary safeguards to protect against "plant and leave" approaches.
- When continuous cover harvest management is ground-based, forest establishment should be restricted to slopes capable of supporting such ground-based technologies.
- On slopes too steep for ground-based harvesting technologies, require:
    - The use of aerial technologies for harvesting and hauling (e.g., cable, helicopter, or drone). or
    - No harvest forest management (e.g., permanent, non-productive indigenous forest; poisoning exotic trees when opening canopy gaps for transition to indigenous species).

The NZ ETS could also be expanded to include a wider range of removals

Expanding the range of permissible removal actions within the NZ ETS may help drive more of these activities and disincentivise potential land uses that result in emissions from these sources.

[50] Based on modelling undertaken by the Climate Change Commission (Climate Change Commission. 2021. *Ināia tonu nei: a low emissions future for Aotearoa*. Wellington: He Pou a Rangi | Climate Change Commission) and the Aotearoa Circle (Aotearoa Circle. 2020. *Native Forests: Resetting the balance*. Aotearoa Circle).

[51] Climate Change Commission. 2021. *Ināia tonu nei: a low emissions future for Aotearoa*. Wellington: He Pou a Rangi | Climate Change Commission.

Forestry is the only source of biological removals currently recognised in the NZ ETS (both exotic and indigenous). However, other nature-based solutions and technological forms of removals exist that are not recognised. Examples include:

- the restoration of wetlands.
- additional removals in pre-1990 forests resulting from good management practices.
- increases in the storage of carbon in our soils due to changes in land-use management.

Of the three options indicated above we believe the simplest option is to extend the carbon accounting boundary of the NZETS to include improved forest management of pre-1990 forest (exotic and indigenous). This can include the following activity types:

- Enhanced removals through enrichment planting of fast-growing exotic species (e.g., Eucalyptus sp.) in pre-1990 regenerating scrub and low forest.
- Enhanced removals and avoided emissions in tall (pre-1990) indigenous forest eligible to be logged under the Forests Act and RMA.
- Extending the rotation age in pre-1990 exotic plantations.
- Converting clear-cut harvesting rotations of pre-1990 exotic plantations to permanent forest, managed using continuous cover forest management methods indicated in Table iv.

Soil Carbon

Soil carbon sequestration rates under different soil management regimes are not readily available in Aotearoa and for this reason a soil carbon option is not ready for deployment at a high resolution of carbon accounting. This gap is currently being remedied through research by the New Zealand Agricultural GHG Research Centre, and could be further remedied through the development of a soil carbon scope of the NZETS through a Soil Carbon Market (SCM) as follows:

SCM Development

The government funds soil carbon pilots registered in the international voluntary carbon market. This can include using existing validated soil carbon methodologies of international standards such as the Verified Carbon Standard (VCS). It can also include developing new soil carbon accounting methodologies and getting them validated to international carbon standards like the VCS.

The pilot projects (if successful) would produce internationally certified carbon credits as a proof-of-concept to validate the activity type and carbon accounting. The SCM, however, would not need to issue carbon credits in the international carbon market, but could instead use the soil carbon measurement infrastructure from the pilot projects to establish soil carbon accounting protocols for a domestic SCM.

Pilot projects could be designed to test different soil carbon management interventions and represent each soil type in each region.

The data from these pilot projects could then be used to create a National Soil Carbon Database (NSCD) and Version 1 of a Soil Carbon Lookup Table (SCLT).

The SCLT could then be used for smaller projects (e.g., less than 100 ha), with larger projects required to directly measure changes in soil carbon stocks using the international voluntary carbon market methodologies and validation/verification protocols or a methodology provided.

The government could issue Soil Carbon Units (SCUs) based on smaller projects using the SCLT or larger projects undertaking direct measurement.

SCUs Could be issued by government based on a similar process to that used for the NZETS forestry participants for smaller projects using the SCLT, and via a verification statement from a VVB for larger projects required to measure.

The government could fund the establishment of independent soil carbon validation and verification bodies (VVB) that would then be available for validation and verification of larger soil carbon projects ineligible for using the SCLT. This would outsource validation and verification services to the private sector, reducing the administrative cost to government and reduce the risk of slow processing of SCU issuance applications.

The government could fund on-going soil carbon sequestration measurement for a representative sample of smaller projects that use the SCLT. This would add valuable data to the NSCD.

All soil carbon data from larger projects ineligible to use the SCLT would be required to submit their data to the NSCD, continually enhancing the data quality of the NSCD through time.

The SCLT could be updated on a 5-yearly cycle using data from the NSCD. This would enable the quality of data to improve through time and reduce the risk of overestimating or underestimating the national soil carbon inventory for international GHG reporting.

The demand side of a domestic soil carbon market could be restricted to agricultural emitters offsetting/insetting their on-farm emissions. SCUs could be used by the farm of origin and surrendered to the government (insetting) or sold to other farms for them to surrender (offsetting).

The SCU price could be set by the government at a rate equal to the mid-range of the Treasury Shadow Emission Prices for the year of issuance (vintage).

Farms that use SCUs for insetting do not have to purchase them at the government rate but acquire them at the cost of production.

Activity types for soil carbon sequestration could include:

- No till agriculture.
- Polyculture rather than monoculture including use of more deeply rooted crops.
- Livestock grazing management.
- Perennial instead of annual cropping.
- Biochar used as a soil conditioner.
- Wetland restoration.

Methane and Nitrous Oxide

Agricultural emissions management can also include emissions reduction of nitrous oxide and methane emissions. As with soil carbon, nitrous oxide and methane methodologies are already available in the international voluntary carbon market (e.g., the VCS). There are also opportunities to create bespoke methodologies and getting them validated in the international voluntary carbon market (e.g., via the VCS).

One approach with minimal methodological complexity is the reduction of herd size in combination with agricultural practices that harness the free work of soil biota. Here, herd size reduction and associated reduction emissions is easy to calculate. Moreover, early action has shown that a combination of herd size reduction and profit-focused agriculture techniques (e.g., those that enhance the work and benefit from soil biota and natural nutrient cycling) can enhance farm profitability.

If the nation was focused on adding value rather than merely adding volume of agricultural exports, and if this was combined with profit-focused farming rather than volume-focused farming then there is a good case for exploring regenerative agricultural techniques as part of a national agricultural emissions reduction strategy.

Moreover, soil micro-organisms are ready and able to do considerable unpaid nutrient cycling work for the farmer if the land management processes let them and foster them. This can reduce fertiliser costs and increase farm profitability.

As with the Soil Carbon Market approach outlined above, the scope of the NZETS could be extended to include nitrous oxide and methane and the issuance of Nitrous Oxide Units (NOUs) and Methane Units (MUs). Activity types to consider include:

Methane

- Reducing herd size.
- Anaerobic digestion of dairy shed effluent to generate methane biogas that can be used as a fuel.
- Bioremediation of methanogenic systems in waterways.

Nitrogen

- Changing fertilizer regimes.
- Reducing nitrogen fertiliser use by increasing the use of natural sources of nitrogen such as clover and other legumes.

For an example of methane reduction through herd size management, farmers could report on historical herd sizes for (say) a 5-year period (with evidence). The farmer could then reduce their herd size, calculate the emission reduction result which is then issued as MUs. These MUs could be surrendered to the government or cancelled as part of a farm carbon inventory (insetting) or sold to other farmers seeking to buy them at the same rate as that set for SCUs (mid-range of the Treasury Shadow Emission Prices).

Some farms may be able to reduce herd size without loss of profitability (e.g., less cows per ha = more grass per cow = more milk per cow). Such farms could sell their MUs to other farms less able to reduce their herd size without loss of profitability. This would create two gains from trade:

1. MU seller creates an additional cashflow adding to farm profitability.
2. MU buyer buys MUs at the carbon price which is cheaper than losing profits.

Such a market mechanism could drive efficiency gains in pastoral herd sized towards optimum efficiency. It would also deliver a series of co-benefits arising from taking pressure off the land, farming families, and waterways. This could include increases in nutrient holding capacity of pastoral soils, stream water quality, and farm biodiversity.

The NZ ETS also currently rewards some industrial activities that remove emissions, including embedding carbon in products and exporting or destroying synthetic greenhouse gases.

However, emerging technologies, such as direct air capture, may also play an important role in the future.

Some additional sources of removals are associated with co-benefits. For example, restoring coastal wetland ecosystems would sequester carbon while increasing biodiversity. Restored coastal wetlands could also play an important role in improving resilience to adverse weather events, by absorbing flood waters and reducing heat stress.

Adding removal activities may have implications for our NDC and incentives to reduce gross emissions

Changes to the type of removals that are included in the NZ ETS may have implications for Aotearoa New Zealand's current and future NDCs.

All removal activities should focus on additional climate change mitigation to deliver on our Paris Agreement obligations and transform to a low-carbon, climate resilient economy.

Currently, our preferred approach for accounting emissions and removals from land use towards our NDC only includes forestry. If removal activities are brought into the NZ ETS that are not covered by our NDC accounting, it could make it more difficult to meet our NDC.

The main problem relates to the allocation of removals for removal activities. If the removals do not count towards our NDC, but emitters can use them as part of their surrender obligations, Aotearoa would effectively be paying for removals that do not help us meet our NDC. This is a significant obstacle to expanding the scope of the NZ ETS to recognise a broader range of removal activities.

To be considered as a credible source of removals and therefore included in the NZ ETS, it is also important that a new removal activity meets the following criteria.

- Additionality. The removal rewarded must be human induced.
- Permanence. The removal should be enduring, and any subsequent carbon emissions (such as from vegetation being cut down) must be penalised on the same basis as carbon removals are rewarded.
- Scientific validity. Methods used to determine the amount of carbon removed must be unbiased and have a reasonable level of precision.

Including additional categories into the NZ ETS would provide a greater source of NZU supply for emitters. Expanding the NZ ETS therefore involves a trade-off, because increasing the supply of NZUs could undermine the incentive to reduce gross emissions. The balance between incentivising additional forms of removal activities in the NZ ETS with the proposals to reduce gross emissions will be considered further when more detailed modelling and analysis is carried out in the next stages of the review.

We recommend that the government redesigns the NZ ETS with the following core elements:

a) A cap-and-trade system by imposing gross emission reduction targets on participating emitters.

b) Directing forestry carbon credit supply towards landscapes requiring climate resilience.

c) Shifts to a policy of avoiding the purchase of 100 million tonnes of offshore mitigation and instead source this mitigation domestically.

Doing so may require the government to provide an additional source of removals. Additional sources of removals that can be supported by existing data sets:

- Enhanced sequestration through enrichment planting of pre-1990 regenerating forest (this will greatly benefit Māori owners of marginal land ineligible for inclusion in the NZETS).
- Enhanced sequestration and avoided emissions through land use change prohibiting indigenous timber harvesting in commercially viable indigenous forests.
- Extending the rotation age of pre-1990 plantation forests.
- Transitioning pre-1990 plantation forests to permanent continuous cover forestry.

Would recognising additional removals with co-benefits in the NZ ETS make them widely attractive?

The costs associated with some additional removal activities and implementation challenges are also barriers to including them in the NZ ETS. Some removals, such as planting of riparian margins and restoring tussock grasslands, do not remove large quantities of carbon. While these activities could deliver wider environmental

benefits, the costs associated with NZ ETS registration, monitoring and verification may be greater than the financial returns a participant would receive for the NZUs that would be earned.

If the scope of the NZ ETS is extended to other forms of removals, the reward provided would be limited to the value of the carbon sequestered. The NZ ETS could be leveraged to incentivise activities that generate environmental benefits beyond carbon sequestration.

However, prioritising removals with co-benefits may not be the most cost-effective way to reduce net emissions. For example, the most appropriate species of tree for controlling erosion may be less efficient at sequestering carbon than others.

Given the critical role the NZ ETS needs to play in our climate response, this would be a significant drawback. If the scheme is reformed to recognise co-benefits, we are interested in your feedback on the extent to which these co-benefits should be prioritised over emissions reductions. The Commission raised similar concerns in its recent draft advice to the Government and suggested a more holistic approach may be more suitable for other emissions removal activities.[52]

Experience in our networks shows that compliance carbon credit buyers seek the least cost carbon credits. Other forms of removals are likely to be more costly than the low-cost options already covered by the scope of the NZETS. We are not convinced that higher priced new carbon credit types would have a market in the NZETS.

WORK UNDERWAY ON COMPLEMENTARY MEASURES SUPPORTING WIDER REMOVAL OPTIONS

Carbon removals strategy

Multiple work programmes are in place across government that relate to carbon removal efforts. These programmes have different objectives and timeframes but have important interdependencies.

The Government is developing a carbon removals strategy to coordinate and prioritise effort and investment across government, the private sector, and communities.

The strategy will address questions such as how many removals we need to complement ambitious gross emissions reductions, what types of removals are prioritised, and how new removal activities can be recognised and rewarded over time. It will also consider how biodiversity, climate resilience and broader co-benefits could be realised.

Development of the strategy will take into account the feedback received as part of this NZ ETS review consultation. Programmes with close links to the strategy are outlined in further detail below.

[52] Climate Change Commission. 2023. *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan*. Wellington: He Pou a Rangi | Climate Change Commission.

Recognising removals as part of the agricultural emissions pricing system

In the section 215 report on agricultural emissions pricing, the Government proposed reforming the NZ ETS to encourage interested parties to invest in science and research, to include further land-use categories in the NZ ETS.[53] Interested parties would be incentivised to invest in research and development early, to increase the likelihood of including additional categories in the NZ ETS as soon as possible after the new system goes live in 2025.

[53] Ministry for the Environment. 2022. *Pricing agricultural emissions: Report under section 215 of the Climate Change Response Act 2002*. Wellington: Ministry for the Environment.

The carbon removals strategy will need to ensure consistency exists in how new on-farm sequestration activities and broader removal activities are measured and considered. On-farm activities will need to be counted consistently across different schemes.

The difficulty with on-farm sequestration on a farm-by-farm basis is that the volume of carbon removals possible on-farm will typically be much smaller than the on-farm emissions needing to be offset. For example, on-farm sequestration from hedges and riparian reforestation is very small in volume per farm because the area of forest concerned is comparatively small. Forest carbon sequestration is measured in tCO2 per hectare (two rugby fields), and it requires a very long riparian planting or hedge to equate to one hectare. Then the amount of sequestration per ha per year is not very high in absolute terms. For example, one ha of riparian native planting if planted at 10 m width (5 m either side of a stream) will need to be 1 kilometre long. The same hectare will produce 4 tCO2e carbon removals by year 5 and 13 tCO2e carbon removals per year at peak production in years 15-18 and decline in annual production thereafter. Compare this with on-farm emissions for a 300 head dairy herd of 890 tCO2e per year, and 358 tCO2e per year for 1,000 head of sheep.

Offsetting the dairy herd through forest sequestration (assuming a 2030 deadline to start offsetting) will require approximately 110 ha of native forest (or 110 km of riparian planting) or approximately 70 ha of eucalyptus forest (or 70 km of riparian planting).

Offsetting the sheep herd through forest sequestration (assuming a 2030 deadline to start offsetting) will require approximately 45 ha of native forest (or 45 km of riparian planting) or approximately 30 ha of eucalyptus forest (30 km of riparian planting).

Clearly, on-farm sequestration is an option for farms with considerable areas of land that are surplus to agricultural production. Alternatively, sequestration to offset on-farm emissions will need to occur off-farm (e.g., in special purpose carbon forest landholdings).

On-farm sequestration into other carbon sinks such as wetlands and soils are an option, but currently excluded from the NZETS. Wetlands on farm tend to be relatively small in comparison to total farm area, whereas soils are as extensive as the pastoral landscape. As such, soil carbon sequestration is likely to be the most useful and most aligned carbon pool to target for on-farm sequestration.

A voluntary carbon market framework

The Government is progressing the development of a VCM framework to support more private–public collaboration, scale up climate activity in Aotearoa, and provide greater assurance of integrity and certainty amid significant changes in global VCMs.

Developing a VCM framework was an important action identified in the emissions reduction plan. Opportunities exist to drive climate mitigation actions outside the NZ ETS, which can be leveraged through VCMs.

Sustainability certifying organisations support the efforts of Aotearoa New Zealand's businesses to measure their baseline emissions, invest in climate mitigation projects, certify their voluntary emissions reduction and removals, and facilitate purchase of carbon credits through international carbon markets.

However, voluntary climate mitigation in Aotearoa is still underdeveloped to meet increasing demand and largely unregulated, lacking the level of clarity and consistency necessary to stimulate greater domestic project development and high-integrity credit generation.

The development of this market could be implemented alongside the options proposed in chapter 6. For example, option 3 would likely result in a reduced incentive for removal activities. An alternative market for removal activities through the VCM could help to maintain or further incentivise these activities, without impacting on the effectiveness of the option of reducing gross emissions.

The opportunity exists for the VCM to support a more ambitious and optimised carbon removal system for Aotearoa through the trade of removal-based carbon credits.

Submission on a Voluntary Carbon Market Framework

A domestic voluntary carbon market (VCM) has the potential to function as an important complementary measure to the NZETS in delivering the dual goals of meeting the nation's Paris Agreement target and the aspiration to be net zero by 2050. The VCM can amplify the beneficial impact of the domestic carbon price, particularly in a price inelastic energy sector. In so doing, the VCM has the potential to help overcome barriers to participation in emission reductions by Greenhouse Gas (GHG) sources and emissions removals by GHG sinks, and thereby scale up climate change mitigation actions across the economy.

On the demand-side of the VCM, voluntary emission reduction opportunities include greater uptake of existing clean technologies and practices, as well as stimulating research and development to create new clean technologies and practices. On the supply-side of the VCM, there are opportunities to help deliver climate resilience, biodiversity, enhanced water quality, and rural employment outcomes.

At the core of an effective domestic VCM is market integrity. This is necessary for the public to have confidence in the benefits that this market can deliver to our climate action goals as a nation. Of particular importance is the value to the public of climate change mitigation and adaptation outcomes that can be delivered at least cost to the taxpayer. This will enable taxpayer funds to be allocated to things that markets cannot provide either in the climate action space or in other sectors of public spending.

The integrity of the VCM can be delivered through a set of rules and safeguards. Of particular importance are:

1. Requirements for VCM participants to use emissions measurement methodologies consistent with international carbon measurement standards.
2. Verification of emissions measurement including requiring third-party verification above a certain emissions volume threshold.
3. Emissions reduction plans capable of driving down emissions, and demonstration of adherence to emission reduction plans.
4. Carbon offsetting from a list of eligible offset types with the latter limited to carbon credits issued in an internationally recognised carbon registry and certified to an internationally recognised carbon standard. Carbon standards that are listed as eligible offsets on the International Carbon Reduction and Offset Alliance (ICROA) are: Verified Carbon Standard, Gold Standard, Plan Vivo Standard, American Carbon Registry, and Climate Action Reserve. We also recommend that permanent forest NZUs issued by the New Zealand Emissions Trading Register be included on this list of eligible offsets.
5. Carbon offsets cancelled upon consumption in the carbon registry.
6. A carbon credit floor price sufficient to:
    a. Appropriately price the external cost of GHG emissions.
    b. Functioning as an authentic economic incentive to stimulate on-going emissions reductions.
7. Third-party certification of a net carbon position (e.g., net carbon zero) that accurately and transparently states the outcome delivered.
8. A two-track system of carbon offsetting as follows:
    a. Track 1: The use of carbon credits that contribute to a country's Nationally Determined Contribution (NDC).
    b. Track 2: The use of carbon credits that are independent of any NDC.
9. Communications rules that require participants to accurately communicate what has been delivered. This includes communicating that the carbon credits are a contribution to an NDC or are independent of an NDC.

As far back as 2007, the Government understood the likely lack of responsiveness of the price inelastic energy sector to emissions pricing below a certain threshold. As shown in Figures vii and viii, the top-down policy instrument of emissions pricing is incapable on its own of delivering a low carbon economy. The carbon price signal in 2022 is beginning to stimulate behaviour and investment change. However, complementary measures

have always been needed to amplify the impact of a carbon price. These include 'sticks' (e.g. regulation or the threat of future regulation) and 'carrots' such as government underwriting of low carbon investment, incentive programmes and the voluntary carbon market.

Figure vii. Impact of emissions pricing on non-electricity stationary energy emissions (Source: Ministry for Economic Development, 2007).

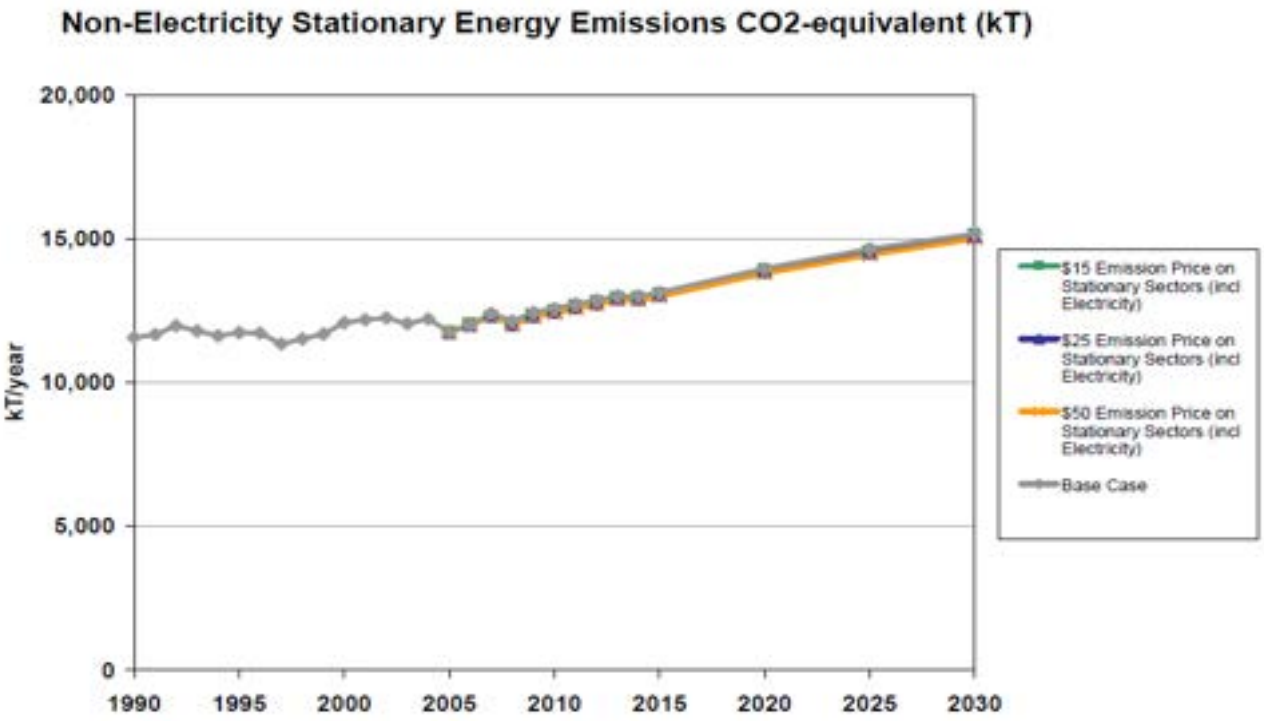
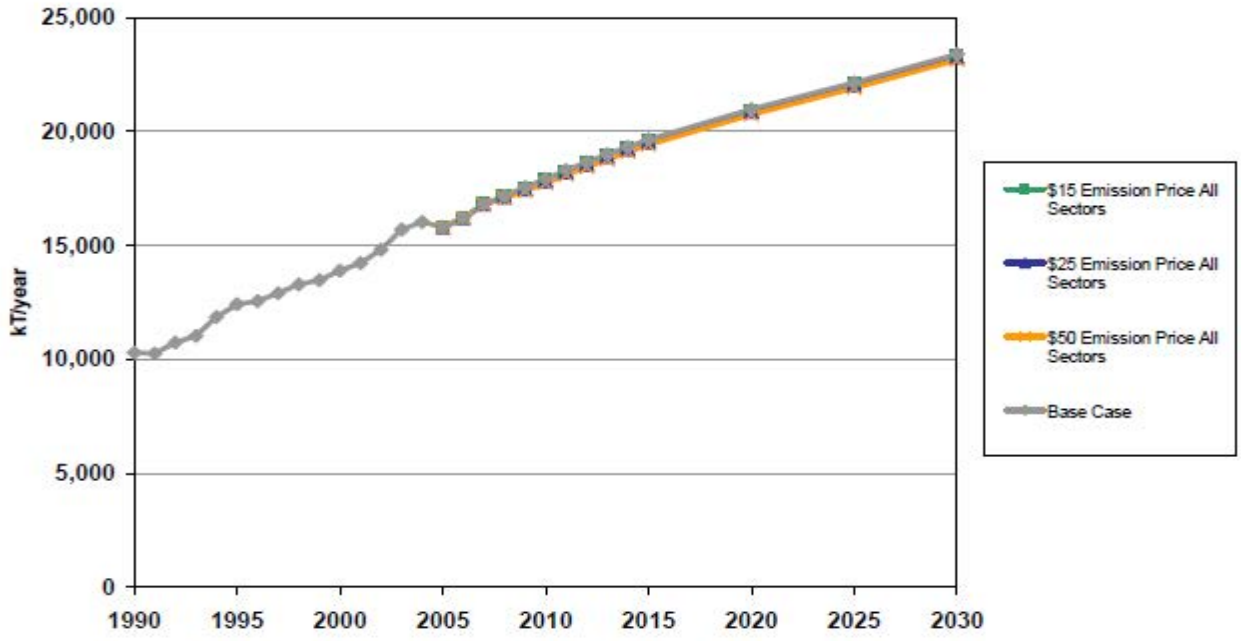


Figure viii. Impact of emissions pricing on transport emissions (Source: Ministry for Economic Development, 2007).



It will not be possible to get to zero emissions from GHG sources (including fossil fuel emissions and emissions from the land use, land use change and forestry sector (LULUCF)) by 2050 (or perhaps ever). This is why the Government has used the term 'net' in the 2050 aspiration where the term 'net' in net-zero carbon means including 'carbon offsets'.

Net-zero carbon assertions involve the following actions:

Pathway 1:

- Carbon footprint measurement (calculating gross emissions).
- Carbon footprint reduction (reducing gross emissions).
- When gross emissions after reductions are not zero (because these residual emissions are impossible or prohibitively expensive to eliminate), and if the voluntary carbon market participant seeks to take responsibility for these residual emissions and voluntarily put a price on the external cost of these residual emissions, they can cause an equal or greater volume of carbon benefits to occur outside their organisational boundary by purchasing a volume of carbon credits to match or surpass their residual emissions.

Pathway 2:

- Carbon footprint measurement (calculating gross emissions).
- Price carbon emissions at the social cost of those emissions (i.e., an estimate of the cost to society from GHG pollution). Make a commitment to pay this price as a voluntary carbon charge. This locks a carbon liability into the organisation's finances that will then function as a financial incentive to reduce emissions as much as possible. Allocate this payment to the purchase and cancellation of carbon credits.
- Carbon footprint reduction (reducing gross emissions) to eliminate energy inefficiency and reduce exposure to the voluntary carbon charge.

The economic principle underlying voluntary carbon offsetting is the marginal cost of emissions abatement and the relationship between this cost and the carbon price. As with compliance carbon management it is economically sensible to reduce emissions when this can be done at a price per tCO_2e that is lower than the carbon price and buy carbon offsets at the carbon price for any emissions abatement that would be more costly than the carbon price.

If the price to voluntarily offset emissions is very low (e.g. NZ$5 per tCO_2e), then it is economically sensible to only reduce gross emissions in-house where the cost is lower than $5/$tCO_2e$ and offset all of the rest. This has led to justifiable criticism of voluntary carbon offsetting by climate action groups worldwide because we will not solve the climate change problem without dramatically reducing emissions.

When the carbon price for voluntary carbon offsetting is much higher and has a meaningful relationship with the external cost of carbon pollution (the social cost of carbon), criticism of voluntary carbon offsetting loses its foundation. This is because high voluntary carbon prices raise the volume of gross emissions that are economically sensible to reduce in-house, thereby reducing the volume of emissions to be offset through carbon credit purchases Here offsetting is restricted to emissions that are impossible or prohibitively expensive to abate in-house. The Treasury has calculated the social cost of carbon for New Zealand, expressed as the Shadow Emission Values for use in cost benefit analysis (Table i).

Table i. Recommended Shadow Emission Values, NZD$ per tonne of CO_2-equivalent (2022-2035)

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Low	48	55	61	67	73	79	85	91	97	101	105	108	112	116
Central	72	81	90	99	108	118	127	136	145	150	156	162	167	173
High	96	108	120	132	144	156	168	180	192	200	207	215	223	230

Source: The Treasury, 2021. CBAx Tool User Guidance. Guide for departments and agencies using Treasury's CBAx tool for cost benefit analysis. September 2021. Appendix 5.

The NZU spot price is beginning to be high enough to have a meaningful impact on voluntary investments in emission reductions and align with the central path of the New Zealand shadow emission values shown in Table i.

However, there are two problems:

1. VCM buyers can currently source low-cost carbon credits internationally (and avoid buying more costly NZUs).
2. The question of a Corresponding Adjustment (CA) to the New Zealand NDC for each NZU used as a voluntary offset.

Carbon Pricing

Tables ii and iii show average carbon prices in the international VCM by carbon standard or activity type.

Table ii. Transacted voluntary carbon offset volume and average price by standard

	2019		2020		To August 2021	
	Volume ($MtCO_2$)	Price/tCO_2 (USD)	Volume ($MtCO_2$)	Price/tCO_2 (USD)	Volume ($MtCO_2$)	Price/tCO_2 (USD)
American Carbon Registry (ACR)	2.5	$5.36	5.4	$8.44	2.0	$11.37
Clean Development Mechanism (CDM)	4.9	$2.02	7.0	$2.19	8.2	$1.13
Climate Action Reserve (CAR)	4.0	$2.34	2.1	$4.44	4.9	$2.12
Gold Standard	13.2	$5.27	13.9	$4.57	5.2	$3.94
Plan Vivo Standard	0.9	$8.99	1.2	$8.49	0.7	$11.58
Verified Carbon Standard (VCS)	44	$1.74	66.1	$3.76	125.6	$4.17

Source: Ecosystem Marketplace, 2021

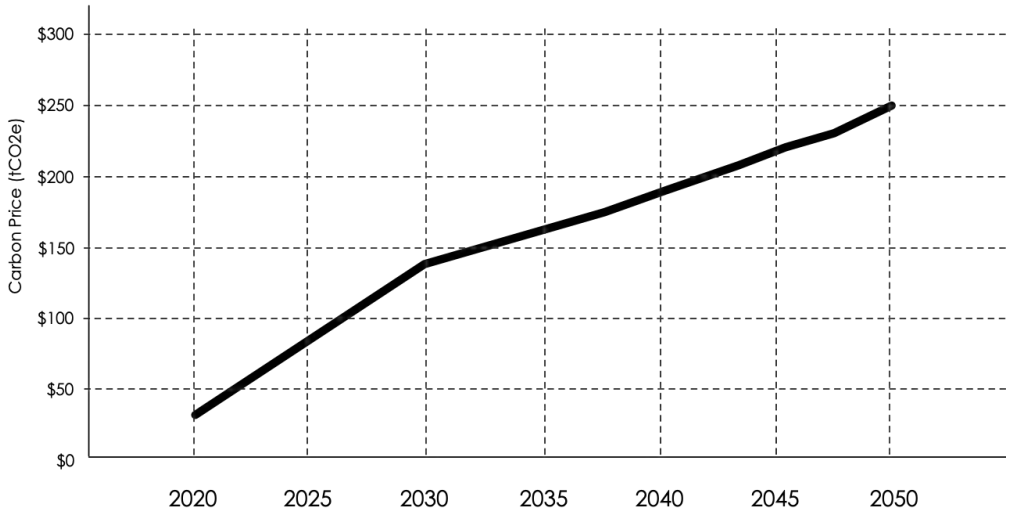
Table iii. Voluntary carbon market size by product category 2019-August 2021

	2019			2020			To August 2021		
	Volume ($MtCO_2$)	Price/tCO_2 (USD)	Value (USDm)	Volume ($MtCO_2$)	Price/tCO_2 (USD)	Value (USDm)	Volume ($MtCO_2$)	Price/tCO_2 (USD)	Value (USDm)
Forestry & Land Use	36.7	$4.33	$159.1	48.1	$5.60	$269.4	115.0	$4.73	$544
Renewable Energy	42.4	$1.42	$60.1	80.3	$0.87	$70.1	80.0	$1.10	$88.4
Energy efficiency/ Fuel switching	3.1	$3.87	$11.9	31.4	$1.03	$32.3	16.1	$1.57	$24.2
Agriculture	-	-	-	0.3	$9.23	$2.8	3.4	$1.36	$4.6
Waste disposal	7.3	$2.45	$18.0	8.3	$2.76	$22.9	2.7	$3.93	$10.6
Transportation	0.4	$1.70	$0.7	1.1	$0.64	$0.7	2.1	$1.00	$2.1
Household devices	6.4	$3.84	$24.9	3.5	$4.95	$17.3	1.8	$5.75	$10.4
Chemical processes/ Industrial manufacturing	4.1	$1.90	$7.7	1.3	$1.90	$2.5	1.1	$3.22	$3.5

Source: Ecosystem Marketplace, 2021

Tables ii and iii show that average international VCM prices vary greatly but, on the whole, are much lower than the NZU spot price, the government price controls that influence the NZU spot price, the Climate Commission carbon price path for energy and transport sectors (Figure ix), and the New Zealand social cost of carbon emissions (Table i).

Figure ix. New Zealand Climate Change Commission emissions price path.



Source: Climate Change Commission, 2022.

The low carbon prices available in the international voluntary carbon market demonstrate two problems:

1. Domestic VCM buyers have access to very low carbon prices incompatible with the social cost of carbon or the Climate Change Commission price path, and function only as a weak financial incentive to reduce emissions. This leads to lower emission reductions by VCM participants who are price sensitive. In contrast, many VCM participants are willing to pay prices compatible with the social cost of carbon and the Climate Commission price path.
2. VCM buyers do not need to buy forestry NZUs, although many do, and are therefore not a predictable source of demand for consuming any oversupply of forestry NZUs.

The current Ministry for the Environment review of the voluntary carbon market presents an opportunity to steer this market to solve these problems. This could include a minimum carbon price that VCM buyers must pay or requiring VCM buyers to purchase NZUs to comply with national guidelines or a national standard on the VCM. One option for this is to require VCM participants to select a floor carbon price from the Treasury Shadow Emissions Values.

We recommend that the government place a VCM carbon offset price floor that aligns with the Treasure Shadow Emissions Values.

The next issue is provide a mechanism for VCM participants sourcing carbon credits internationally at a price point well below the VCM price floor. Options for meeting the VCM price floor when sourcing low cost international carbon credits include:

1. Pay a higher price to the international supplier to match the VCM price floor.
2. Purchase additional international carbon credits to meet the spending per tCO^2 required to meet the VCM price floor.
3. Purchase domestic or international carbon credits that are priced equal to or higher than the VCM price floor.

4. Purchase eligible 'benefit units' from a unit-based mechanism to bring the aggregate unit price to the VCM price floor.

An example of 'benefit units' could include a biodiversity unit from a biodiversity unit producing programme, or an emissions reduction unit (a form of carbon insetting) from a project seeking to deliver additional emissions reductions outside the business boundary of the buyer.

Corresponding Adjustments

A key consideration in the operation of voluntary carbon markets inside national carbon accounting boundaries is the question of double-counting and the need for corresponding adjustments (CA) for any voluntary carbon claim that the NDC covers. In practice, a CA involves a government adjusting its NDC to ensure that only the VCM buyer, not both the VCM buyer and the Government, can count the carbon benefit associated with the carbon credit. An example is where an NZU (1 tCO2e) is used as a voluntary carbon offset by a VCM participant, but the same tCO2e is not cancelled from the NDC.

Some international policy advocates argue that all carbon offsets contained within an NDC require a CA to safeguard against double-counting risk. International VCM standards like the Verified Carbon Standard and Plan Vivo assert that the place where double counting is material and where CAs are necessary is in intergovernmental carbon accounting. The Verified Carbon Standard and Plan Vivo already issue carbon credits inside an NDC and tag these credits as 'carbon contribution units' (i.e., contributions to the NDC). The only way a carbon credit does not contribute to an NDC is if it was created outside any NDC (e.g., international oceans or outside the carbon accounting boundaries of NDCs) or if a CA is applied to the NDC to cancel that carbon benefit from the NDC.

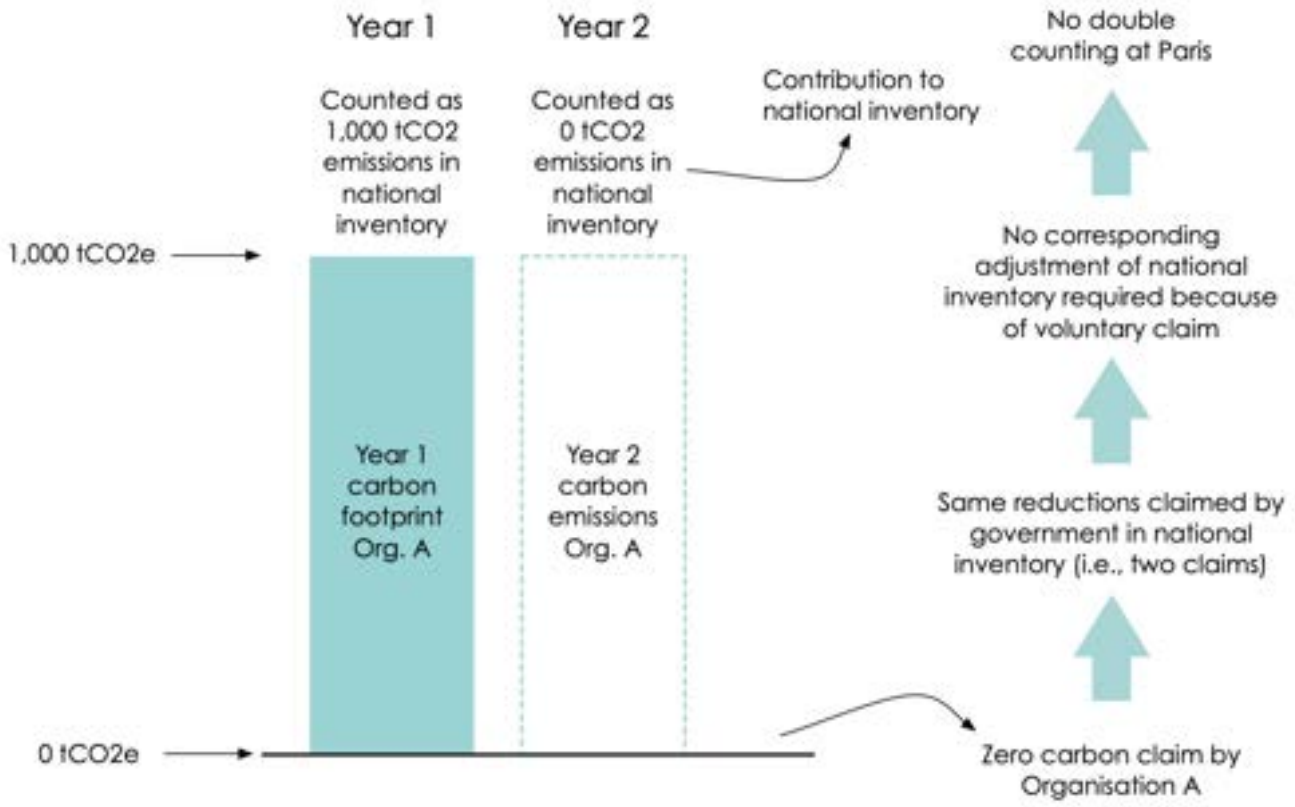
Illustrative examples are presented below and conclude that corresponding adjustments are not needed (they are administratively burdensome anyway), as well as unnecessary if the communication rules governing carbon-related claims in the VCM are transparent about what is taking place.

Gross Zero Carbon Claims and Corresponding Adjustments

Imagine Organisation A aspires to become net-zero carbon. It measured its base year (Year 1) carbon footprint, which was verified to be 1,000 tCO2e. It then reduced all these emissions to zero in Year 2 through investments in technologies and behaviour change (i.e., gross emissions amount to zero). Organisation A is then certified as zero carbon, which is true. Here, an emission reduction of 1,000 tCO2e has been caused by a voluntary action – because no law or regulation is compelling Organisation A to do so. This voluntary action encompasses a 1,000 tCO2e contribution to the NDC. This means that two entities will claim the same 1,000 tCO2e reduction (Figure x).

In this situation, the Government will not make a CA to its national inventory (i.e., it will not delete this 1,000 tCO2e from the national inventory), even though there is a double claim on the same emission reduction action. While there is a double claim, there is no double counting. This is because the carbon accounting arena where double counting matters is the Paris Agreement. Moreover, there is currently no proposal for the Government of any country to make a corresponding adjustment for emission reduction elements of VCM claims, even though all voluntary emission reductions will be claimed by the Government and the organisation that delivered it.

Figure x. Concept diagram of double claiming of voluntary emission reduction actions.

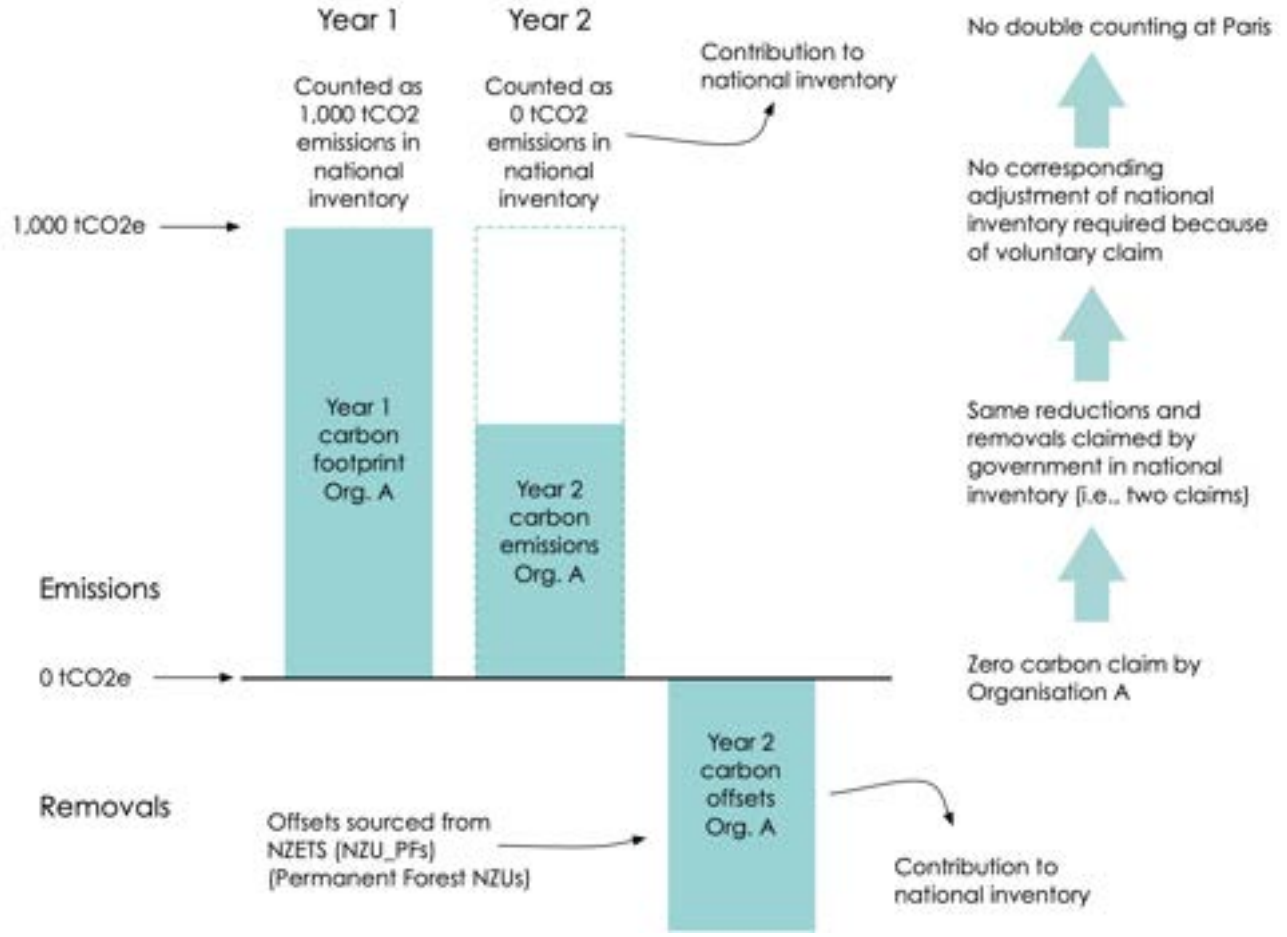


A useful analogy of the safety of double claims that are not double counting can be seen in a hospital setting: a surgeon saves someone's life on the operating table. She legitimately claims that she saved this life, which is true. The DHB that employs her also legitimately claims that the DHB has saved this same life – this is true because the DHB employs and manages this surgeon. Here are two legitimate claims from one intervention, but there is no double counting. Similarly, consider the relationship between a business and Gross Domestic Product (GDP): a business grows by $1 million in annual turnover and claims it has done so. The national GDP grows by $1 million due to the increase in annual turnover of this business and the Government makes the (legitimate) GDP claim.

Emission Removals and Corresponding Adjustments

The underlying logic in the above analysis also applies when carbon offsets from the domestic compliance carbon arena are introduced to the picture, assuming all things are otherwise equal. In other words, if a corresponding adjustment is not required for voluntary emission reductions undertaken inside the NDC, then a corresponding adjustment is also not required for emission removals undertaken inside the NDC. There is no material difference in relation to the New Zealand national target under the Paris Agreement (Figure xi).

Figure xi. Concept diagram of double claiming of voluntary emission removal actions.



Net-Zero Carbon Claim Rules

The key to the integrity of VCM claims is the certification and communication rules associated with those claims. For instance, such rules and communications should make it clear that all voluntary emission reductions and removals within the carbon accounting boundary of the New Zealand NDC consist of voluntary contributions to the national target. This would provide a domestic net-zero carbon claim that required minimal administrative change by the Government.

We recommend:

1. Permanent forest NZUs be the only type applicable to the voluntary carbon market. This unit type should also be available to compliance buyers in the NZETS to enable:
    a. Investment in permanent forestry to be unconstrained, and
    b. De-risking forest carbon projects specialising in permanent carbon forestry, especially native carbon forestry, whereby demand for these carbon credits is not restricted to the voluntary carbon market demand sector.

2. Clarification of the Ministry for the Environment guidelines and Commerce Commission rules on voluntary carbon claims that provide two options for voluntary carbon claims:

a) *Track 1 Contribution to national target*

All voluntary *emission reductions* and *emission removals* undertaken within an NDC comprise contributions to that NDC. Communication rules for those using Track 1 require transparency on this point.

b) Track 2 Contribution to national target and direct relationship with the atmosphere

All voluntary emission reductions *undertaken within the New Zealand NDC* comprise contributions to the national target; any emission reductions and removals *undertaken outside any NDC* would comprise a direct carbon accounting relationship with the atmosphere. Communication rules for those using Track 2 require transparency on this point.

In a domestic voluntary carbon market operating with the safeguards described above, New Zealand would drive down its domestic emissions and create additional demand for any oversupply of forestry NZUs. Also, if the forestry NZUs available to voluntary carbon market participants are restricted to permanent forest NZUs, with an emphasis on indigenous forests or exotic forests transitioning to indigenous forests, then the voluntary carbon market would deliver a major contribution to climate change resilience, catchment protection and biodiversity conservation at no cost to the taxpayer.

Administration of Carbon Claim Rules

Quality control and quality assurance infrastructure already exists in the New Zealand voluntary carbon market with at least two actors providing certification and administering certification rules – Ekos (privately-owned) and Toitū Envirocare (government-owned). The question is whether an additional quality assurance system needs to be hosted by the government.

Given the small size of the VCM in Aotearoa New Zealand we believe it is more efficient and would be administratively less costly if the government provides accreditation to VCM certifiers rather than establish a government VCM certifier.

We recommend that the government provides accreditation/approval of third-party certification programmes that have transparent certification rules/programme instructions, and where these rules demonstrate adherence to all relevant international carbon accounting standards and international VCM integrity initiatives.

Carbon Offsets from Outside the Forest Sector

As indicated above, there is no need for corresponding adjustments for carbon benefits delivered in the voluntary carbon market if the carbon-related claims are transparent about what is occurring (i.e., a contribution to the national target). This, in principle, presents the opportunity to operate a voluntary carbon market in sectors including but not limited to the forest sector. Such examples potentially include the energy sector, agriculture, soils, pre-1990 indigenous forests, wetlands, saltmarshes/blue carbon.

It is not necessary for the government to create a new instrument for this. Instead, international voluntary carbon market standards already issue 'carbon contribution units' inside NDC jurisdictions (e.g., for activities covered by the New Zealand NDC) and standard carbon credits for activities sitting outside the NZ NDC (e.g., blue carbon).

The government has the option to name the international carbon standards that it accepts for carbon offset projects and programmes. Then the process of verification of carbon credits to a standard need not be administered by government, but instead administered by existing actors in the international voluntary carbon market setting.

Minimum Requirements to Develop a Well-Functioning VCM in NZ

The minimum requirements for a well-functioning VCM in Aotearoa New Zealand include:

- Public confidence in the value of the VCM to contributing to the nation's Paris Agreement target and net zero carbon by 2050 aspiration.
- Demand-side integrity.
- Transaction integrity.
- Supply-side integrity.

Public Confidence

Public confidence in the VCM will arise from a combination of transparent integrity of the VCM and public education to clarify and communicate this integrity.

Public Education

There is considerable confusion in the public domain around the issue of carbon markets, carbon offsetting, net zero carbon and similar carbon-related themes. Some of this confusion has arisen from a lack of public understanding of the purpose of the VCM, its value in helping to deliver our Paris Agreement obligations, net zero carbon by 2050 aspiration, and avoiding dangerous climate change. There is also public confusion concerning carbon markets, why they are valuable, and how the integrity of the VCM can be safeguarded.

In our experience, public commentary in recent years and months tends to fall into the following categories:

- Distrust of market instruments, with the assumption that markets enable private enrichment off a public policy priority (e.g., a perceived priority for private gain rather than a financially self-sustaining initiative).
- Distrust of carbon offsetting with the assumption that it enables greater emissions (failure to understand that voluntary offsetting is voluntary and that permission to emit already exists because it is not illegal to use electricity, drive, send and receive freight etc).

Restoring public confidence cannot be guaranteed, even with the best public education effort. There is, however, merit in at least providing better public education on the VCM.

We recommend that MfE includes a public education component in its effort to strengthen the VCM, with this public education initiative focusing on the following:

- The difference between the compliance carbon market and the voluntary carbon market.
- The purpose, value, and necessity of voluntary mitigation action (e.g., a carbon price is not enough to stimulate behaviour change).
- The quality controls in voluntary emissions measurement and reduction.
- The difference between gross and net zero carbon.
- The very important fact that it is typically impossible to get to gross zero carbon.
- Measuring and reducing emissions is a good thing.
- Voluntarily electing to price the external cost of residual emissions and pay that price through carbon offsetting is a good thing, because it functions as a financial incentive to reduce more.
- The social cost of carbon emissions has been calculated by Treasury, and that this can be used to price residual emissions to ensure that this is not a cheap "get out of jail free" card.
- We need to build climate resilient landscapes through permanent reforestation.
- Purchasing carbon credits from permanent reforestation helps to build these climate resilient landscapes at no cost to the taxpayer.
- The taxpayer is already stretched, so market instruments such as the VCM are a way to finance our climate action aspirations without undue additional burden on the taxpayer.

Demand-Side Integrity

We recommend that MfE strengthen the demand-side integrity of the VCM through:

a) Aligning the regulatory environment of the Aotearoa VCM with international best practice initiatives such as:
   - Integrity Council for the Voluntary Carbon Market (ICVCM).
   - The Voluntary Carbon Markets Integrity Initiative (VCMI).
   - The International Carbon Reduction and Offset Alliance (ICROA).
   - Climate Active (Australia's voluntary carbon market integrity system).

b) Requiring residual emissions to be appropriately priced with a price floor aligned to the NZ Treasury Shadow Emissions Prices. This will enable the voluntary carbon price to properly function as a financial incentive to reduce more and more appropriately benchmark the point at which the higher marginal cost emissions abatement actions should be left unharvested and outsourced via carbon offsetting.

Transaction Integrity

We recommend that MfE strengthen the transaction integrity of the VCM through requiring all carbon-related claims to be certified by an approved carbon certifier where the latter has publicly available certification rules/programme instructions that align to international carbon measurement, verification, and communication standards.

Supply-Side Integrity

In this section we outline how carbon sequestration can legitimately be used to offset greenhouse gas (GHG) emissions. This is based on carbon accounting principles arising from international carbon accounting guidance from the Intergovernmental Panel on Climate Change, the UNFCCC, international carbon market supply-side (i.e., carbon credit) standards, and international carbon market integrity initiatives.

At the core of the matter is the difference between carbon flux, carbon sequestration and the subset of carbon sequestration that can be legitimately used to offset GHG emissions.

Carbon Sequestration and Carbon Offsets

Carbon markets function by means of a set of rules designed to stimulate additional activities that will reduce carbon emissions from sources and enhance carbon removals by sinks. A key principle in carbon markets relating to carbon sequestration is that the sequestration that is eligible to be used to offset emissions must be:

1. A human intervention.[1]
2. Additional to what nature would do anyway (e.g., additional to sequestration by natural forests and the oceans).
3. Additional to what humans would do anyway (e.g., additional to activities already required by law or regulation).

This is the concept of additionality. In carbon projects there are three main components of additionality:

1. Project additionality.
2. Regulatory surplus.
3. Financial additionality.

[1] According to the United Nations Framework Convention on Climate Change (UNFCCC): climate change mitigation "involves human interventions to reduce the emissions of greenhouse gases by sources or enhance their removal from the atmosphere by "sinks". A "sink" refers to forests, vegetation or soils that can reabsorb CO_2." Source: UNFCCC 2009. Fact sheet: The need for mitigation. Available here: https://unfccc.int/files/press/backgrounders/application/pdf/press_factsh_mitigation.pdf

Project additionality means that the carbon benefits represented by carbon credits issued need to be only those carbon benefits made possible by the human intervention undertaken in the project.

Regulatory Surplus means that the activities in the carbon project are not required by law. For example, if it is illegal to clear pre-1990 regenerating native forest under the RMA, then natural carbon sequestration taking place in that regenerating forest is not additional.

Financial additionality means that the carbon benefits delivered by the human intervention of the project is caused by the revenue from the sale of carbon credits. In this way, the purpose of carbon credit sales revenue is to fund an activity that could not happen without that revenue.

Table v provides examples of different aligned definitions of additionality by different carbon market standards and integrity initiatives.

Table v. Additionality definitions by different carbon standards & programmes.

Carbon Standard	Additionality Definitions/Guidance
Verified Carbon Standard Methodology Requirements (2022).	A project activity is additional if it can be demonstrated that the activity results in emission reductions or removals that are in excess of what would be achieved under a "business-as-usual" scenario and the activity would not have occurred in the absence of the incentive provided by the carbon markets. Additionality is an important characteristic of GHG credits, including VCUs, because it indicates that they represent a net environmental benefit and a real reduction of GHG emissions, and can thus be used to offset emissions. Methodologies shall set out a procedure for demonstrating additionality using a project method or a standardized method (i.e., performance method or activity method). Source: Verified Carbon Standard 2022. Methodology Requirements. V4.2
Plan Vivo	The benefits from a *Project Intervention* are considered to be additional if they would not be achieved in the absence of the *Project.* Source: Plan Vivo Standard 2022. Glossary. v1.0.
Gold Standard	Additionality is a defining concept of carbon-offset projects. To qualify as a genuine carbon offset, the reductions achieved by a project need to be 'additional' to what would have happened if the project had not been carried out (e.g. continued as business-as-usual). The concept of additionality is important as only carbon credits from projects that are "additional to" the business-as-usual scenario represent a net environmental benefit. Without the "additionality" requirement, there is no guarantee that the emissions reduction activities will lead to a reduction of greenhouse gases into the atmosphere. Therefore, in simple terms, if carbon credits are awarded to activities that would have happened anyway, emissions are allowed to rise without a corresponding cut elsewhere, therefore making the process meaningless. Any business or individual considering purchasing carbon credits to ask questions to ensure that the standard or system backing the credits require proof of additionality. Source: https://goldstandardhelp.freshdesk.com/support/solutions/articles/44001989691-what-does-additionality-mean-and-why-is-it-important-
CDM	**Project Additionality** The first requirement is that the project activity is not a 'null' activity; that is, it achieves real 'net anthropogenic GHG removals by sinks' relative to the 'business as usual' scenario (called the 'baseline scenario'). **Financial Additionality** The second requirement is that the project activity must be in need of additional resources and it should be possible to cover this resource gap with the expected CDM revenue. That is, the financial incentives expected from carbon credits under the CDM must be demonstrated to be both necessary and sufficient for the project activity to be implemented. Thus the difference made by the financial incentives expected from carbon credits must be shown to be a decisive factor in enabling the project activity. Source: UNFCCC 2013. Afforestation and reforestation projects under the Clean Development Mechanism. A reference manual. https://unfccc.int/resource/docs/publications/cdm_afforestation_bro_web.pdf

Integrity Council for the VCM	The greenhouse gas (GHG) emission reductions or removals from the mitigation activity shall be additional, i.e., they would not have occurred in the absence of the incentive created by carbon credit revenues. Integrity Council for the Voluntary Carbon Market 2022. Core carbon principles, assessment framework and assessment procedure. July 2022.
ICROA	Project-based emission reductions and removals shall be additional to what would have occurred if the project had not been carried out. ICROA members shall demonstrate the project would not have occurred without the availability of carbon finance. Source: International Carbon Reduction and Offset Alliance 2019. Code of best practice for carbon management services. Technical specification.
Carbon Offset Guide	GHG reductions are *additional* if they would *not* have occurred in the absence of a market for offset credits. If the reductions would have happened anyway – i.e., without any prospect for project owners to sell carbon offset credits – then they are not additional. Additionality is essential for the quality of carbon offset credits – if their associated GHG reductions are not additional, then purchasing offset credits in lieu of reducing your own emissions will make climate change worse. Source: https://www.offsetguide.org/high-quality-offsets/additionality/

The UNFCCC definition of climate change mitigation and the additionality requirements of carbon standards and integrity initiatives make it clear that carbon sequestration that is happening anyway[2] does not constitute climate change mitigation, is not additional and therefore cannot be legitimately used to offset GHG emissions.

This means that the natural sequestration occurring in the ocean, saltmarshes, natural forests, and soils are not eligible to be used to offset carbon emissions unless:

- They result from a human intervention.
- The human intervention is beyond business as usual (the baseline).
- The human intervention causes measurable carbon benefits to the atmosphere above and beyond the baseline scenario.
- The measurable difference between the intervention (project scenario) and the baseline scenario is the volume of carbon benefits caused by the intervention and only this volume is issued as carbon credits.
- The human intervention requires revenue from the sale of carbon credits to occur.

We recommend that MFE provide a list of eligible carbon standards to be used as a source of carbon credits for voluntary carbon offsetting as follows:

- Permanent forest NZUs.
- Verified Carbon Standard.
- Gold Standard.
- Clean Development Mechanism.
- Plan Vivo.[3]
- Climate Action Reserve.
- Joint Implementation.
- American Carbon Registry.
- Emissions Reduction Fund (ERF) of the Australian Government.

Each of these carbon standards (apart from the permanent forest NZUs) is listed as an eligible offset type by the International Carbon Reduction and Offset Alliance (ICROA). Note that each of these carbon credit types is issued by an internationally recognised carbon registry.

[2] For example, where nature is delivering this sequestration service such as the ocean absorbing CO_2 or natural regeneration without any human intervention or land use change.

[3] The ICROA endorsement of the Plan Vivo standard occurred after publication of its 2019 Code of Best Practice. Its 2022 announcement on Plan Vivo is provided here: https://www.icroa.org/post/icroa-endorses-plan-vivo-standard

Summary of Recommendations on the VCM

Objective	Recommendation
Policy priorities	We recommend that the government place a VCM carbon offset price floor that aligns with the Treasure Shadow Emissions Values.
	We recommend: 1. Permanent forest NZUs applicable to the voluntary carbon market available to the VCM and the compliance carbon market. 2. A two track system of carbon offsets: a) *Track 1 Contribution to national target (emission reductions and carbon offsets).* b) *Track 2 Contribution to national target (emission reductions) and direct relationship with the atmosphere (carbon offsets).*
	We recommend that the government provides accreditation/approval of third-party certification programmes that have transparent certification rules/programme instructions, and where these rules demonstrate adherence to all relevant international carbon accounting standards and international VCM integrity initiatives.
	We recommend that the Carbon Neutral Government Programme (CNGP): • Be required to acquire carbon credits from the MFE list of eligible offsets. • Where permanent forest NZUs are used these should be restricted to projects that demonstrate the delivery of climate resilience and biodiversity conservation such as native forest carbon projects on erosion-prone lands). • Internationally sourced carbon credits from the Pacific Islands with a focus on projects that deliver multiple UN Sustainable Development Goals.
	We recommend that the rules of the CNGP should align with international best practice in carbon accounting and be certified by an accredited/approved third-party certification body (i.e., not self-certify).
Minimum requirements	We recommend that MfE includes a public education component in its effort to strengthen the VCM.
	We recommend that MfE strengthen the demand-side integrity of the VCM through: a) Aligning the regulatory environment of the Aotearoa VCM with international best practice initiatives. b) Requiring residual emissions to be appropriately priced with a price floor aligned to the NZ Treasury Shadow Emissions Prices.
	We recommend that MfE strengthen the transaction integrity of the VCM through: a) Requiring all carbon-related claims to be certified by an approved (i.e., by MFE) carbon certifier where the latter has publicly available certification rules/programme instructions that align to international carbon measurement, verification, and communication standards. b) All carbon credits used as carbon offsets to be recorded in a transparent and publicly accessible carbon credit sub-registry to ensure that carbon credit retirements/cancellations are accurately recorded. Such sub-registries comply with/align to ICROA / IETA / IC-VCM positions on the role of block chain.
	We recommend that MfE strengthen the supply-side integrity of the VCM by requiring all carbon offsets to be: a) Issued by an internationally recognised carbon registry, and b) Certified to an internationally recognised carbon standard, and where such standards demonstrate robust additionality criteria.
	We recommend that MfE strengthens the supply-side integrity of the VCM by compiling a list of eligible carbon credit types that can be legitimately used as carbon offsets in the VCM. We recommend the following list: • Permanent forest NZUs. • Verified Carbon Standard.

	• Gold Standard. • Clean Development Mechanism. • Plan Vivo. • Climate Action Reserve. • Joint Implementation. • American Carbon Registry. • Emissions Reduction Fund (ERF) of the Australian Government.
Small size of Aotearoa VCM	We recommend that the government focuses its attention on creating a regulatory environment to strengthen the integrity, functionality, purpose and scope of the existing VCM using the recommendations above.
Alignment with International best practice	We recommend that MfE strengthen the VCM through aligning an Aotearoa VCM with international best practice initiatives such as: • Integrity Council for the Voluntary Carbon Market (ICVCM). • The Voluntary Carbon Markets Integrity Initiative (VCMI). • The International Carbon Reduction and Offset Alliance (ICROA).

Carbon Neutral Government Programme

The emissions reduction plan also set out that, by 2025, emissions that cannot be reduced under the CNGP must be offset. This programme could therefore play an important role as a driver of demand in a VCM or suitable alternative mechanism.

The carbon removals strategy will consider where this investment could be best directed. For example, CNGP could prioritise support for development of new and emerging removal activities, or focus on activities that also support biodiversity co-benefits, or focus on meeting our international targets. These decisions will depend on the relative priorities of the strategy.

We recommend that the Carbon Neutral Government Programme (CNGP):

- Be required to acquire carbon credits from the MFE list of eligible offsets.
- Where permanent forest NZUs are used these should be restricted to projects that demonstrate the delivery of climate resilience and biodiversity conservation such as native forest carbon projects on erosion-prone lands).

This would:

- Drive up much needed investment in each of these sectors.
- Comprise a key component of a financing strategy for the National Climate Change Adaptation Plan.

Government could assist in the development of new activity types in the VCM supply chain by funding commercial pilot projects/demonstration activities for each new activity type. This would enable different activity types to demonstrate their cost-effectiveness and profitability, provided the financial information arising from those publicly funded pilots were made available to the public.

We recommend that the rules of the CNGP should align with international best practice in carbon accounting and be certified by an accredited third-party certification body (i.e., not self-certify).

Biodiversity credit system

The Government is also exploring other policy measures to enhance biodiversity and support wider environmental benefits. For example, work is currently underway to understand the potential role that a biodiversity credit system might play in supporting the protection of biodiversity. This could complement the NZ ETS and, like the VCM described above, be implemented alongside the options proposed in chapter 6. Such a system would seek to drive private investment to directly reward actions that will protect, expand and enhance indigenous diversity.

Climate change mitigation is about reducing GHG emissions from sources and GHG removals by sinks (GHG benefits to the atmosphere). Biodiversity conservation initiatives can deliver GHG benefits, but such benefits only constitute climate change mitigation by the volume of those GHG benefits measured in tCO2e. Because of this, biodiversity conservation that does not deliver measured GHG benefits cannot materially counterbalance GHG emissions in the form of offsetting.

This does not mean that biodiversity conservation has no potential role in carbon-related claims. But here it is worth considering the compliance carbon market (e.g., the NZETS) and the voluntary carbon market. The purpose of the compliance carbon market is to enable the country to deliver on our Paris Agreement obligations. Biodiversity conservation that also delivers measurable CO2 removals can contribute to our Paris Agreement obligations and already does so with indigenous reforestation registered in the forestry provisions of the NZETS. But any biodiversity benefits that do not constitute CO2 benefits to the atmosphere are invisible to the Paris Agreement.

For this reason, biodiversity crediting systems that focus on measured, reported and verified biodiversity conservation outcomes are not appropriate to be used as offsets for compliance buyers in the NZETS. Biodiversity crediting systems are, however, potentially appropriate for use in the voluntary carbon market. To safeguard the integrity of the voluntary carbon market, however, we recommend that in their forthcoming guidance on the VCM MFE specify that biodiversity credits are not 'carbon offsets' and cannot be used for a net zero carbon claim (or equivalent). We also recommend that MFE guidance on the VCM state that biodiversity credits could be used for carbon-related claims that avoid the terminology 'net zero'.

We note that Ekos has developed a biodiversity markets financing instrument in the form of the Sustainable Development Units (SDU) Programme. While the scope of the Ekos SDU Programme includes any of the UN Sustainable Development Goals, we note that UN-SDG 15 (Life on Land) is a biodiversity scope and applicable for the approach. We also note that Ekos have developed a biodiversity credits pilot project for the SDU Programme at Sanctuary Mountain Maungatautari.

The SDU Programme is a unit-based, market-based instrument that delivers measured, reported, and verified outcomes to buyers that cause these outcomes through purchasing SDUs. The outcomes purchased can range from measured uplift in biodiversity status, through to measured biodiversity conservation interventions (e.g., invasive pest eradiation).

The unit price is calculated transparently at cost and is stamped on each unit issued in our SDU registry. This is a demand-led instrument and projects must secure buyer contracts before they can issue units.

CONCLUSION

Options are available within the NZ ETS Review, and in other active work streams, to recognise and incentivise a wider range of removal activities with environmental co-benefits.

The Government is interested in your feedback on whether it should recognise a wider range of removals and increase the incentive for removals with co-benefits, and whether the NZ ETS, or other mechanisms are the best way of doing this.

Chapter 7 Consultation questions	
7.1	Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?
7.2	If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?
7.3	Should a wider range of removals be included in the NZ ETS? Why/Why not?

7.4	What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

Yes. We recommend that the most cost-effective way to do this is to change the permanent forest category to allow any non-wilding species to continue under this category but impose continuous cover forestry management requirements on all registrants (including indigenous forests). This will enable restorative sustainable forest management (exotic) and indigenous forestry to occur in this category. This will remove the option of 'plant and leave' carbon farming and enable forestry practices that deliver significant climate resilience and biodiversity ecosystem services as co-benefits.

7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

The point of the NZETS is to deliver carbon benefits to support the delivery of our Paris Agreement obligations and to help the nation avoid dangerous climate change. For this reason, the nation needs to maintain a laser focus on carbon benefits arising from a carbon market instrument. Wider co-benefits are a nice-to-have rather than a 'must-have'. As such, we need to focus on delivering the must-have outcomes at least cost to the taxpayer and at least risk to communities. The least cost solution that delivers the least risk to communities is continuous cover forestry for the permanent category of the NZETS. To be financially viable, continuous cover forestry include exotic and indigenous species for the simple reason that indigenous species grow much too slowly to deliver a financially viable business case for private investors seeking to contribute to the nation's climate change response.

Because indigenous reforestation can be financially viable when included in a business model that has significant areas of exotic permanent forest, we know that indigenous reforestation is possible in the existing NZETS. The challenge here, however, is a blended business model is less profitable than one that maximises profitability by excluding indigenous reforestation. The existing NZETS could be modified to include financial support to stimulate greater uptake of indigenous reforestation.

If such support is offered as a grant (e.g., modelled on the 1 Billion Trees Fund), then the taxpayer will have to pay for such a grant. This will be challenging in a cost-of-living crisis. Alternatively, we recommend that financial support be offered as low-cost debt co-financing for projects planting indigenous forest. In this way the impact on the taxpayer is reduced (the debt is repaid and recycled) but the benefit to the project developer is significant through gaining access to low-cost capital (e.g., unsecured debt financing at 3% p.a. for 50% of the investment required). In this way, the taxpayer is only be asked to be a bank rather than a grant provider, or to be the buyer of higher priced indigenous forest carbon credits.

7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?

We recommend the inclusion of pre-1990 indigenous forest as the first step in expanding the scope of the NZETS. We also recommend a sub-set of the NZETS be developed for soils, methane and nitrous oxide with demand restricted to the agricultural sector.

7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

The government could consider differentiating indigenous forest carbon credits at issuance to give participants an opportunity to purchase indigenous carbon credits knowing that this is what they have purchased. We note that indigenous carbon credits fall into three main categories:

1. Natural regeneration (nature did the planting for free and so there is very low capital expenditure required).

2. Pre-planted indigenous forest (indigenous forest planted by people but funded under a separate funding programme (e.g., local government grant, philanthropic grant, 1BT grant).
3. Newly planted indigenous forest (indigenous forest planted by people without separate funding).

Of these three categories, numbers 1 and 2 may not need a premium on the carbon price to be commercially viable as a forest carbon project. Option 3, however, will require a price premium to be commercially viable. One possibility is for option 3 indigenous forest to be categorized as such, and gain access to a premium. This premium could be delivered whereby demand side NZ ETS participants are required to purchase a percentage of their NZUs from indigenous projects (e.g., 10%). This requirement will mean that the Forestry NZU market will operate as two markets in parallel – one market and pricing system for standard forestry NZUs, and another market and pricing for indigenous NZUs. The supply/demand dynamic for indigenous NZUs will reveal a median price through time as project developers secure supply agreements at prices sufficient to break even.

Glossary

Term	Description
2050 targets	Aotearoa New Zealand's domestic emissions reduction targets, prescribed in section 5Q of the Climate Change Response Act 2002. It requires net zero greenhouse gas emissions (except biogenic methane) and a 24–47% reduction in biogenic methane by 2050.
Abatement	The emissions reductions and removals we achieve within Aotearoa (our net emissions reductions).
Accounting	In the NZ ETS this refers to the methodology for quantifying the changes in the carbon stored in registered forests from tree growth, and the amount emitted upon events such as harvesting and deforestation.
Afforestation	Establishment (whether by planting or natural regeneration) of forest on land that did not previously have tree cover.
Auctioning	The selling of NZUs by the government to the market through an auctioning system within the NZ ETS. Auctions are held quarterly and open to account holders in the NZ ETS Register.
Auction reserve price	A price control in the NZ ETS. The auction reserve price is the minimum price the government can sell NZUs through auctioning.
Averaging accounting	A method to account for carbon storage in forests intended to be harvested that are also registered in the NZ ETS. Forests will earn NZUs up until the age the forest is expected to reach its long-term average carbon stock over multiple rotations of replanting and harvesting.
Biodiversity	The variability among living organisms from all sources, including land marine and freshwater ecosystems and the ecological complexes of which they are a part. This includes diversity within species (including genetic diversity) between species and of ecosystems.
Biodiversity credit	An economic instrument that recognises in a consistent way either projects and/or activities that provide positive outcomes for biodiversity, against which 'nature positive' claims can be made.
Carbon dioxide equivalent (CO_2-e)	A unit of measurement used to compare greenhouse gases on the basis of their global-warming impact, by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential
Carbon Neutral Government Programme (CNGP)	An ongoing government work programme to accelerate the reduction of emissions within the public sector.
Carbon sequestration	The uptake and long-term storage of carbon dioxide from the atmosphere (eg, in vegetation).
Carbon sink	Natural and artificial processes which take carbon dioxide from the atmosphere and store it are known as 'carbon sinks'. Forests are a good example of a carbon sink, as they take in and store carbon dioxide through the process of photosynthesis.
Climate Change Commission	An independent Crown entity that advises the government on climate change policy within the framework of the Climate Change Response Act 2002.
Climate Change Response Act 2002 (CCRA)	This Act puts in place a legal framework for Aotearoa to meet its international obligations under the UN Framework Convention on Climate Change, the Kyoto Protocol, and the Paris Agreement, including the implementation operation, and administration of the NZ ETS.

Term	Description
Complementary policy	Government policies that support and reinforce the effects of emissions pricing instruments (such as the NZ ETS) by addressing market barriers and failures.
Cost containment reserve (CCR)	A price control in the NZ ETS. The cost containment reserve is a reserve of NZUs which are available for sale only if a trigger price is reached in the auction.
Demand	The demand for NZUs within the NZ ETS market. This includes the demand for NZUs by emitters to meet NZ ETS surrender obligations and the demand for NZUs for investment purposes.
Deforestation	The conversion of forest land to other land use.
Demonstration pathway	A set of measures and actions proposed by the Climate Change Commission for New Zealand to reduce emissions and achieve the 2050 targets.
Emissions	Greenhouse gases released into the atmosphere from human activity.
Emissions budgets	A total quantity of emissions that is allowed to be released in Aotearoa during an emissions budget period. Each emissions budget covers a period of five years (except the first emissions budget which covers the period 2022–2025).
Emissions leakage	The risk of climate policies – in particular emissions pricing measures – reducing emissions in one location but causing emissions to increase elsewhere so that global emissions overall do not reduce. Emissions leakage is created by the uneven implementation of climate policies in different countries.
Emissions intensive and trade exposed (EITE)	Industrial activities carried out in Aotearoa where the output of the activity 1) creates high levels of emissions per unit of product and 2) is traded overseas.
Emissions reduction plan	The emissions reduction plan sets out how New Zealand will meet its first emissions budget (2022–2025) and sets the path towards meeting our long-term climate targets.
Emissions removals	Also known as 'carbon removals' and 'offsetting', the removal and permanent storage of emissions through various activities.
Exotic forest	A forest in which the main species does not occur naturally in Aotearoa.
Forest	Forest land in the CCRA means an area of land of at least one hectare that has, or is likely to have, tree crown cover from forest species of more than 30% in each hectare.
Gross emissions	The total greenhouse gas emissions from agriculture, energy, industrial processes and product use, and waste.
Industrial allocation	The free allocation of NZUs to firms carrying out emissions intensive and trade-exposed activities for the purposes of mitigating the risk of emissions leakage.
Indigenous forest	A forest species that occurs naturally in Aotearoa or has arrived in Aotearoa without human assistance.
International climate change goals	New Zealand is committed to international climate change targets as a part to the United Nations Framework Convention on Climate Change and the Kyoto Protocol.
Marginal abatement cost curve (MACC)	Models showing the abatement potential of greenhouse gas mitigation measures, and the relative costs associated with each of these measures.

Term	Description
Nationally Determined Contribution (NDC)	NDCs represent efforts by each country to reduce national emissions and adapt to the impacts of climate change, as part of their obligations under the Paris Agreement. Aotearoa has adopted an NDC for the period 2021–2030 that requires a 50% reduction of net emissions below our gross 2005 level by 2030.
National Environmental Standards for Plantation Forestry (NES-PF)	Regulations made under the Resource Management Act to manage the environmental effects of plantation forestry, including those from planting, forest management, and harvesting.
Net emissions	Net emissions are gross emissions and the emissions and removals from land use, land-use change, and forestry.
New Zealand Emissions Trading Scheme (NZ ETS)	A market-based policy to reduce emissions of greenhouse gases. The NZ ETS puts a price on emissions, charging certain sectors of the economy for the greenhouse gases they emit, and rewarding activities that remove emissions from the atmosphere.
New Zealand Unit (NZU)	One 'emissions unit' is equal to one tonne of carbon dioxide equivalent. NZUs can be traded among people and businesses participating in the NZ ETS.
Offshore mitigation	Also known as 'international units' and 'overseas credits'. Offshore mitigation refers to emissions reductions or removals that occur outside Aotearoa.
Participant	In the NZ ETS, a participant is a person or entity that is registered and participates in a forestry activity or carries out an activity covered by the NZ ETS.
Permanent forest	Permanent forests are those not intended to be clear fell-harvested but may be subject to select or small coupe harvesting.
Permanent post-1989 forest category	A new category (activity) in the CCRA which was available from 1 January 2023. Participants who opt to enter the permanent forest category will remain in the NZ ETS for 50 years. Forest land registered in the permanent forest category will earn on the stock change approach, and participants will be unable to clear-fell their forests for 50 years.
Removals	The result of activities that take carbon from the atmosphere and store it, such as forestry.
Secondary market	The market in which previously issued NZUs are traded.
Stockpile	The volume of NZUs being held in the NZ ETS Register by account holders.
Supply	The supply of NZUs within the NZ ETS from different sources, including forestry, auctioning, and industrial allocation.
Surrender	The transfer of one or more units to the Crown surrender account in the NZ ETS Register to meet an emissions obligation in the NZ ETS.
Vintaging	The application of expiration dates for emissions units. NZUs are currently not vintaged.

Voluntary carbon market (VCM)	A market for the voluntary buying and selling of carbon credits that represent the reduction or removal of emissions achieved through mitigation actions, such as afforestation or avoided deforestation. This is distinct from

Term	Description
	compliance markets, such as the NZ ETS, where entities have obligations to participate and surrender emissions units.

11 August 2023

NZ ETS review
Ministry for the Environment
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Via email: etsconsultation@mfe.govt.nz

Tēnā koutou

A functional Emissions Trading Scheme with the right incentives

Powerco welcomes this opportunity to provide feedback on the proposed changes to the New Zealand Emissions Trading Scheme (*ETS*) and the "permanent forest category" (together, *ETS review proposals*). The ETS review proposals and the Biodiversity Credit Scheme (*BCS*) are linked, and Powerco will separately engage on the BCS.

Powerco is one of Aotearoa's largest gas and electricity distributors, supplying around 344,000 (electricity) and 113,000 (gas) urban and rural homes and businesses in the North Island. These energy networks provide essential services and will be core to Aotearoa New Zealand achieving a net-zero economy in 2050. Information about our network is provided in Attachment 1. Powerco is committed to reducing our own greenhouse gas emissions, we have measured and reported on our emissions by way of a Greenhouse Gas Emissions inventory since FY 2019/2020. In addition to internal measures to reduce our greenhouse gas emissions; we are currently considering how those efforts could be supported in future, by offsetting via the voluntary carbon market.

Powerco is a participant in the ETS in relation to our operation of electrical switchgear containing sulphur hexafluoride. We therefore have interests in both the ETS compliance and voluntary market in this ETS review.

Summary of Submission

Powerco broadly supports the objectives behind the ETS review and BCS, namely to:

- Strengthen incentives for gross emissions reductions and domestic climate action.
- Incentivise appropriate afforestation, including the amount of exotic forest planting incentivised.
- Develop better protection of New Zealand's biodiversity.

Powerco's key submissions are as follows:

a) Powerco supports a **functional ETS and stable market through policy certainty**. A steady and predictable New Zealand Unit (NZU) price is a critical signal to support businesses to make the necessary investments in decarbonisation and electrification to meet our 2050 target. Reforms to the ETS should seek to avoid policy uncertainty, market instability and price volatility.

b) While driving gross emissions reductions is critical, penalising early movers on climate action through retrospective changes that undermine forestry investments will not provide the policy confidence needed to support either gross emissions reductions or net emissions reductions through indigenous and where appropriate, exotic forestry. Powerco therefore supports policy reform that includes the **recognition and grandfathering of existing investments** and forestry registrations.

c) The voluntary offset market is at a critical stage in New Zealand. Development of a **formal framework for voluntary participation** in credible emissions reductions would support wider domestic decarbonisation and avoid New Zealand businesses being forced to invest in offshore decarbonisation and emissions removal projects.

d) A **biodiversity credit market is appropriate** and necessary. Powerco supports the development of the market as a priority in the next Government term. This market could serve dual purposes – supporting voluntary action and also supporting resource consent applicants to substantiate "net gain" outcomes associated with development under the Resource Management Act 1991 (*RMA*) and its successor legislation.

Powerco feedback on ETS review proposals

A functional ETS and stable market

Recent policy uncertainty caused by changes to ETS policy settings, including the ETS Review and changes in approaches to NZU pricing and supply, has caused market and NZU price volatility. This policy and pricing uncertainty creates disincentives to both investment in gross and net emissions reductions. Decarbonisation projects are capital intensive and require predictability in pricing to support business cases. Without a consistent and predictable price signal, emitters are unlikely to make decarbonisation investments of the scale necessary to achieve the Climate Change Response Act's 2050 targets.

Before progressing any material ETS policy reform, it is necessary to consider how that reform will impact the ETS, NZU pricing and our ability to achieve the 2050 targets. Market participants – both mandatory and voluntary – urgently need certainty on the future structure of the ETS to keep national and entity-level emissions reduction targets within reach.

Driving gross emissions reductions whilst not penalising early movers on climate action

Powerco urges the Government to take into account two principles for any ETS reform option:

- Creating a clear signal on future policy direction to reintroduce stability to the market and certainty for all market participants as soon as possible. This will unblock not only NZU trading, which is currently dampened due to market uncertainty, but will also give investors the confidence to progress decarbonisation projects, many of which are also currently on hold given the uncertainty regarding investing in those initiatives vs carbon removals.
- Any changes to the ETS, particularly those that might impact the value of forestry units, should only apply prospectively, not retrospectively. Retrospective application of any changes would not only undermine existing property rights in those units (and forestry holdings more generally) but would also effectively penalise early movers in the voluntary market who have sought to invest in carbon removals as a mechanism to enhance climate action.

Permanent forest category redesign – the role of native forestry in the ETS and beyond

The ETS review proposals note that the current settings incentivise removals from faster-growing exotic forest. The Government has expressed general support for increasing indigenous afforestation levels and has introduced a parallel consultation on the "permanent forest category" (the *PFC*) introduced to the ETS from 1 January 2023 to support this.

Powerco supports the move to incentivise native afforestation and recognises the significant benefits and co-benefits of native forests, including protecting and restoring New Zealand's rapidly deteriorating biodiversity, providing freshwater and land stability improvements and involving communities more actively in carbon farming (through the promotion of indigenous silviculture and nurseries).

Powerco also recognises the range of interests that currently exist in exotic pine plantation forestry, which have been built up in reliance on current market settings. To enable the transition to a greater proportion of indigenous forest over time without the market shock of a sudden change, Powerco supports transition forest concepts and carbon accounting that specifically supports and enables that transition without penalisng existing investment.

Transition forests would enable Powerco and other voluntary market participants who have invested or are considering investing in forestry removals to meet emissions reduction targets while supporting the move from exotic to indigenous plantation.

Over time, as forests transition to a greater proportion of permanent indigenous forestry, Powerco supports investigation of how the benefits of those forests beyond carbon mitigation might be used to

incentivise restoration and enhancement of New Zealand's natural environment. We see a direct link to the proposed BCS, and the offset regime under the new Natural and Built Environment Act.

Formalising a role for the voluntary offset market

The voluntary carbon market is at a critical point of potential expansion in New Zealand. 2023 marks the first year that many of New Zealand's largest companies and financial institutions will commence mandatory climate-related disclosures. As organisations develop, set and report on emissions reductions targets, many will be considering the use of voluntary market offsets to provide a climate positive response for those emissions that cannot be reduced.

According to the Voluntary Carbon Markets Initiative (VCMI), a non-profit initiative launched at COP 26 in 2021:[1]

> *Voluntary carbon markets have the potential to help fill gaps in financing for climate mitigation, enhance corporate efforts to transition to Net Zero and support the achievement of countries' Nationally Determined Contributions and sustainable development objectives. They can also support and accelerate the introduction of robust, well-designed climate policies.*

A range of non-state actors are taking action through voluntary carbon markets in New Zealand and internationally.[2] International initiatives, including the Taskforce on Scaling Voluntary Carbon Markets and VCMI, have released reports on methods of scaling these markets globally and ensuring that voluntary offsetting claims have integrity.

The ability for the voluntary carbon market to 'fill the gaps' in New Zealand's climate mitigation is currently limited. Many New Zealand companies would like to acquire voluntary market offsets from credible New Zealand-based emission reduction or removal projects. Domestic projects are likely to have a range of other environmental, social and stakeholder engagement benefits for the communities in which New Zealand businesses operate. However, at present, outside of the ETS there are relatively few options to source New Zealand-generated and credible gross or net emissions reduction projects. Given the potential double-counting credibility issue associated with utilising NZUs without commensurate Nationally Determined Contributions adjustments, many New Zealand corporates are forced to look overseas.

Powerco therefore supports consideration of how the ETS could provide a clear, readily available and credible source of domestically generated, robust voluntary market offsets. Powerco stresses that development of a functional voluntary market should not be pursued to the detriment of the ETS

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1 Voluntary Carbon Markets Initiative, *Claims Code of Practice: Building integrity in voluntary carbon markets* (June 2023), at 5 (available here).

2 McKinsey estimated that demand for carbon credits internationally doubled between 2017 and 2020 in the aftermath of the Paris Agreement being signed, and that demand could reach up to 1.5 to 2.0 gigatons of carbon dioxide (*GtCO2*) by 2030 and up to 7 to 13 GtCO2 by 2050 (McKinsey & Company, *A blueprint for scaling voluntary carbon markets to meet the climate challenge* (January 2021), available here).

compliance market – it will be important that predictable price signals and liquidity is present in the ETS markets. However, given the scale of the ETS review the Government is embarking on, Powerco supports consideration of the domestic voluntary market as part of this policy package in reductions and removals.

The development of a government-led framework for voluntary market actions can build on the current guidelines around the voluntary market[3] and draw on international developments and literature (most notably, the VCMI in late June 2023 released the *Claims Code of Practice: Building integrity in voluntary carbon markets*. This, together with the final report of the Taskforce on Scaling Voluntary Carbon Markets,[4] provide guidance on integrity of claims, market infrastructure, governance and implementation that the New Zealand Government could look to in formalising our own framework).

Powerco understands the complexities that may be associated with development of a voluntary carbon market in New Zealand, including reconciling voluntary market activity with the national greenhouse gas inventory (via corresponding adjustments). However, the current lack of clarity on the appropriate operation of the voluntary market threatens the integrity of units traded and claims made by entities. We ask the Government to prioritise the development of a more formal voluntary carbon market framework.

Indigenous forestry, biodiversity credits/offsets and effects management policy collaboration

As a lifeline utility, Powerco provides a service that at times creates unavoidable effects on the environment, which are (where necessary) mitigated, offset or compensated for under the RMA. Reliance on such mitigation, and in particular offsetting and compensation, is likely to increase as a result of the recently released National Policy Statement on Indigenous Biodiversity and the increased recognition of the 'effects management hierarchy' in planning documents.

Powerco is interested to see how the BCS could support greater investment in biodiversity improvements through the role of biodiversity credits or offsets, and their potential role in environmental effects offsetting and compensation. A BCS could play a key role in both enabling biodiversity compensation through the effects management hierarchy and in further incentivising native afforestation outside the drivers within the ETS.

Any future BCS should be developed in close connection with ETS reform so that decisions regarding incentivisation of native afforestation and the BCS work together to encourage greater pace and scale of conversion from exotic to native forestry over time.

3 MfE "Interim guidance for voluntary climate change mitigation" (2022) and MfE, "Guidance for voluntary carbon offsetting – updated and extended until 31 December 2021" (2019).

4 January 2021, available here.

Conclusion

Powerco supports the objectives of these reforms, namely, to further protect our environment in emissions reduction, improved land use and protection of biodiversity.

Powerco's submission seeks to ensure any reforms provide certainty needed in the ETS price signal, do not undermining existing emissions investments, and encourage entry into the voluntary carbon market, for the benefit of Aotearoa New Zealand's environment and economy.

Should officials require any additional information regarding Powerco or the changes sought above, please do not hesitate to contact us via Adam Du Fall, Ph [redacted] or email: [redacted]

Ngā mihi,

Adam Du Fall
Head of Environment
POWERCO

Powerco has read and acknowledges the Privacy Statement outlined in the Consultation Document dated June 2023.

Attachment One – Further information about Powerco

Powerco is New Zealand's largest electricity distribution network and largest gas distribution network in terms of network length. Our network spreads across the upper and lower central North Island servicing 344,000 (electricity) and 113,000 (gas) homes, businesses and industries. This represents 16% of the electricity connections and 46% of gas connections in New Zealand. Our electricity distribution network measures over 28,000 km in length and our gas network 6,100 km.

Joint Submission to: Te Arotake Mahere Hokohoko Tukunga Review of the New Zealand Emissions Trading Scheme, and,
A redesigned NZ ETS Permanent Forest Category.

On behalf of: Banks Peninsula Native Forest Climate Change Group (BPNFCCG)
Contact details: Suky Thompson representing BPNFCCG
[redacted]

Banks Peninsula Native Forest/Climate Change group is an informal inter-agency alliance seeking to improve opportunities for biodiversity through native forest restoration on Banks Peninsula, principally through enabling landowners who restore native forest to gain an income from the carbon sequestration and other benefits these forests provide. We have restricted the scope of our submissions to matters affecting this aspiration.

The group is comprised of representatives from:

Agri Intel NZ
Carbon Crop NZ
Environment Canterbury
Forever Forests NZ[1]
Lucas Associates
Maurice White Native Forest Trust (Hinewai Reserve)
Orion New Zealand Ltd
Whaka-Ora Healthy Harbour
Banks Peninsula Conservation Trust
Christchurch City Council
Banks Peninsula Federated Farmers
High Bare Peak
Manaaki Whenua / Landcare Research
QEII National Trust
Rod Donald Banks Peninsula Trust

Banks Peninsula is a land-mass of approximately 100,000ha. In pre-colonial times the land was largely forested, and although it was cleared down to less than 1% by 1910, it has now naturally recovered to be 15%-20% forest cover. This makes the Peninsula an ideal location to regenerate native forest on a landscape scale, particularly in its steep sided and relatively shaded gullies, as there is a large indigenous seed stock and birds to spread it. Native forest regenerates rapidly on the Peninsula provided land is only very lightly grazed by sheep , or stock are withdrawn.

There is a strong conservation movement on the Peninsula, with many landowners, including four rūnanga, engaged in native natural regeneration. Two covenanting agencies, QEII National Trust and Banks Peninsula Conservation Trust, are highly involved with the landowning community and encourage best practice, providing support and channeling funding to help cover some costs for landowners wanting to protectnative forest on their land. Covenants ensure that these forests are protected in perpetuity.

Many landowners are interested in earning an income from growing native forest. Banks Peninsula therefore provides a place to help meet the Climate Commission's long term goal of establishing more native forest in New Zealand, and could easily provide an additional 25,000ha or more if the barriers to registering naturally regenerating areas into in the Emissions Trading Scheme were removed, the price of NZUs for native forest is kept high and preferably attracts a premium over other types of credits, regenerating areas are not cleared to make way for exotic forests, and landowners had clarity and certainty about the path forward.

With this in mind, we make the following statement about the proposed changes to the Emissions Trading Scheme and the Permanent Forest Category. After this statement we provide answers to relevant consultation questions

[1] Forever Forests have opted out of endorsing this submission, having made their own submission presenting some differing views

Changes to the Emissions Trading Scheme

1. We support Option 4 to separate the incentives for gross emissions reduction from emissions removal. The current combined market is failing for the reasons identified in the consultation document, and we see greater government controls as necessary to meet the long term goals of both gross emissions reductions and removals based on a much greater percentage of indigenous forests.
2. We support NZUs derived from indigenous forest commanding a premium price
3. We suggest that separating the markets would enable the government to find ways to meet its Treaty obligations in relation to Māori land.
4. We support the introduction of all the complementary measures suggested in the consultation document to support wider environmental benefits and incentives removal activities with wider environmental benefits, including:
    a. supporting the Aotearoa New Zealand Biodiversity Strategy
    b. complement regulatory protection of biodiversity through national direction and resource management reform
    c. incentivise specific removal activities with co-benefits (such as indigenous afforestation)
    d. align with the incentives for indigenous afforestation in the proposed redesigned permanent forest category (currently out for consultation)
    e. introducing a Voluntary Carbon Market trading in NZUs
    f. and the Carbon Neutral government programme

Changes to the Permanent Forest Category:

5. Our preferred position is that the Permanent Forest Category is used solely for indigenous forests that are intended to be in place for ever, and not for forests which are intended for clear felling at a later date.
    a. The current Permanent Forest category has been too permissive in allowing for exotic forests, fostering inappropriately located forests with negative environmental impacts while failing to incentiviseindigenous forestry as recommended by the Climate Commission
    b. In future, all forests that are intended for harvest should be registered under the averaging category, and this category should be amended to deal with different types of harvesting
    c. Forests that are registered under the Permanent category should be limited to Indigenous Forests with the expectation that they will be in place forever and preferably placed under a covenant.
    d. We have great concerns about the concept of Transition Forests being included as part of Permanent Category because:
        i. they are an unproven and untrialled concept
        ii. they could well lead to the spread of wildings; even if known wilding species are excluded, there are likely to be issues in future with species that do not have a long history in New Zealand or that could prove detrimental under a changing climate
        iii. the category is likely to be used as a way to continue gaining credits for exotic forests
        iv. they will by their nature have a different and exotic fungal assemblage.
    e. The category could be renamed as “Perpetual Indigenous Forest” to distinguish it from the previous Permanent Forest category with the registrations since Jan 2023.
6. If Transition Forests are to be retained as a concept in the ETS, then we recommend that they are made a separate category. This would allow for:
    a. Māori and other landowners with land that is difficult to develop to still plant transition forests
    b. Tight control over the category, including:
        i. a high burden of proof on the landowner that the transition is taking place
        ii. limiting the amount of Transition Forest, giving time to develop appropriate methodologies for measuring progress with such forests and to assess if wilding issues are emerging.
    c. We assume that species selection to avoid wilding spread will be controlled by the new NES-PF, but if not, then controls will be needed within the ETS.
    d. No Transition Forests should be permitted in areas that already contain native forest, or are naturally regenerating. Such land should be retained as native forest, and therefore entered within the new Perpetual category.
7. We seek better recognition in the ETS for different growth patterns of naturally regenerating native forest

a. Natural regeneration provides an efficient method for establishing native forest in areas where there is already a seed source

b. Barriers to such areas being currently registered in the ETS include:

    i. The requirement to age forests and to establish that they are pre-1990

    ii. The minimum average width of 30m requirement, as regeneration happens around the periphery of existing areas, expanding out slowly.

    iii. We suggest that the minimum average width requirement is removed (certainly for areas where natural regeneration or planting is happening at the periphery of existing areas), and that pre-1990 areas should be accepted for registration if they are part of a larger area and provide the seed source, or were woody scrub or gorse pre-1990.

8. We seek a premium for credits from indigenous forests that are protected in perpetuity with high environmental and biodiversity value

9. We support the concept of Biodiversity Credits stapled to ETS units as well as the Perpetual Category being for indigenous forests only

10. We suggest that the government also pursue other methods to support indigenous forests including :

    a. Recognition of the process of Natural Regeneration by removing barriers to registering naturally regenerating native vegetation

    b. Recognition of the covenanting mechanism and agencies

    c. Implementing a Voluntary Carbon Market – but preferably based on the same criteria as the ETS

    d. Increased funding for covenanting organisations - QEII National Trust and Banks Peninsula Conservation Trust

    e. More grants to landowners protecting indigenous forest with covenants in order to meet the initial costs of fencing and pest control

11. We support all forests included in the ETS having management plans that require pest control as a minimum, but also weed control.

Responses to NZ ETS Review consultation questions

Please note that we have only answered questions relevant to the scope of Banks Peninsula Native Forest Climate Change group.

Chapter 2 Expected impact of current NZ ETS

2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

Many landowners on Banks Peninsula who are currently grazing sheep and beef on steep land that is prone to growing scrub (ie gorse, broom, other weeds and native species) would like to revert this land to indigenous forest and have become more interested in doing so after the NZU prices rose. However, the barrier to participation has been the difficulty of registering naturally regenerating areas into the ETS due to having to prove the forest age and to convince MPI that it is post 1990 forest. The barrier is the process, not the NZU price.

2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

We agree with the impacts listed and add that an increase in exotic afforestation can also lead to a decrease in indigenous biodiversity through clearing of marginal land that contained pockets of indigenous forest, or regenerating indigenous forest, and even if such areas are not cleared, they can be quickly polluted with exotic wildings.

Chapter 3: Driving gross emissions reductions through the NZ ETS

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

We agree that NZ must reduce its gross emissions and that the ETS is the primary tool to drive this.

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3.3 How important do you think it is that we maintain incentives for removals? Why?

Incentives for removals should be maintained but strongly aimed at encouraging native forest for all the co-benefits it brings and for long term sequestration.

Chapter 4: Changes to the NZ ETS would be significant for Māori

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

We appreciate that Māori owners may have different interests, but have not discussed our submission with local rūnanga therefore do not comment further.

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Chapter 5: Objectives and assessment criteria

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

Yes. Reducing gross emissions is important to meet our international commitments without relying too heavily on the purchase of overseas credits. Removals, particularly through indigenous forest, will also be critical to meeting out international commitments and to halting the biodiversity crisis, and to maintaining NZs unique identity.

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

Yes – for the reasons in 5.1, and also because reducing emissions and limiting global heating and climate change is essential to preserve our native biodiversity.

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?
Yes – but the focus needs to be on the right sort of removals which is native forest.

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.
Supporting co-benefits needs to be strengthened to assist in halting the ecological crisis, supporting biodiversity. While Chapter 6 states that the "focus on removals reflects the Government's broader commitment to nature-based solutions that remove carbon, increase resilience, and promote greater biodiversity" but this doesn't come through in the primary assessment criteria or key considerations.

Chapter 6: Options identification and analysis
6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?
Option 4

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.
Yes

6.3 Of the four options proposed, which one do you prefer? Why?

We support Option 4 because the current ETS which attempts to solve two problems (reducing gross emissions and incentivising removals with a single price mechanism) has proven a failure. We are skeptical that a purely market driven mechanism will address the significant long term problem of climate change, and suggest that government intervention and controls are needed to incentivise behavior.

6.4 Are there any additional options that you believe the review should consider? Why?
Please see our submission on the Review of the Permanent Forest category.

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?
We understand that the current NES-PF is under review, and assume that the replacement will contain policies needed to deal with species susceptible to wilding spread.

Chapter 7: Broader environmental outcomes and removal activities – possibly the most important area for us to submit on
7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?
Yes – the ETS should incentive indigenous afforestation, particularly through natural regeneration.

7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?
As under Option 4 that emitters are required to purchase and surrender units from indigenous forests.
7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?

Yes "additional removals in pre-1990 forests resulting from good management practices" is something we have been advocating for.
To avoid a price drop, emitters with surrender obligations must therefore be limited in their use of removal units to meet these obligations.

7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?
We support all of the ideas presented – Voluntary Carbon Market, Agricultural emissions pricing, Carbon Neutral Government programme and Biodiversity credits.

Responses to Permanent Forest Category Review consultation questions

Please note that we have only answered questions relevant to the scope of Banks Peninsula Native Forest Climate Change group.

Design Choice 1: Which forests should be allowed into the permanent forest category?

Question 4: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? (Note, options 1.2a and 1.2b are not mutually exclusive)

We prefer an option that is not considered in the consultation document as follows:

- ***No forests that are planned for harvesting should be included in the Permanent category. Such forests should be registered under the Averaging category***
- ***Transition forests should be a separate category***
- ***Permanent Indigenous forests, preferably protected by covenants, should be in a separate category – which we suggest is called Perpetual Indigenous to distinguish it from the Permanent category***
- ***The Permanent category should be for existing forests registered in it and exotic forests planted for purposes such as land stabilization that are not ever intended to be clear felled.***

Question 7: Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?

We are very concerned about the wilding risk from exotic species, but suggest this is controlled through the NES-PF.

Design Choice 2: How should transition forests be managed to ensure they transition and reduce the financial risks to participants?

We are extremely concerned that Transition Forests

- ***are an unproven and untrialled method***
- ***could well lead to the spread of wildings, even if known wilding species are excluded, there are likely to be issues in future with species that do not have a long history in New Zealand or that could prove detrimental under a changing climate***
- ***the category is likely to be used as a way to continue gaining credits for exotic forests***
- ***will by their nature have a different and exotic fungal assemblage and not therefore be the same as forests which have started as native forests.***

We therefore consider the number and scale of Transitional Forests should be tightly controlled, and their progress assessed every reporting period.

Design Choice 3: How should permanent forests be managed?

All forests registered in the ETS should have management plans.

Forests in the Perpetual category should be protected by covenants to ensure that they remain protected and under the same management plan on any change of ownership.

TE AROTAKE MAHERE HOKOHOKO TUKUNGA

REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME

Ministry for Environment
Mamatu Mo Te Taiao

Ministry for Primary Industries
Mana Tu Ahu Matua

Ministry for Business, Innovation & Employment
Hikina Whakatutuki

Submission:

Waste Management New Zealand Limited

11 August 2023

1. SUMMARY

1.1 Waste Management New Zealand ("**WMNZ**") welcomes the opportunity to comment on the discussion document proposing to review the New Zealand Emissions Trading Scheme (**"ETS Review"**). As the ETS review will have an impact on the management of waste and WMNZ's operations, WMNZ considers careful thought needs to be given to how gross emissions are to be reduced and New Zealand's climate change targets met.

1.2 WMNZ considers that the ETS review provides strong supportive policy direction for infrastructure services, however, WMNZ's role and observations as a critical infrastructure provider has shaped its submissions and its support for option 4 of the proposed review. WMNZ makes additional comments at the conclusion of this submission on the future of the carbon credit scheme and considers that indigenous planting and carbon sequestering are critical methods that recognise investment made by companies such as WMNZ.

1.3 WMNZ would like to engage with the review panel to discuss the matters raised in this feedback. It is noted that WMNZ have previously provided feedback on this matter through WMNZ's submission to the Climate Change Commission on the *2023 Draft advice to inform the strategic direction of the second emissions reduction plan*.

2. WMNZ

2.1 WMNZ is New Zealand's largest waste and environmental services company, with landfill, recycling, composting and other waste management operations located across New Zealand. Operating across 70 locations it directly employs over 1,600 New Zealanders and each year it invests more than $50 million in new capital works. The services that are provided by WMNZ are essential and critical infrastructure that fundamentally underpin the quality of life that all New Zealanders enjoy and are vital in sustainably protecting the future of New Zealand's natural environment.

2.2 In partnership with local authorities, WMNZ operates a number of landfills, recycling and resource recovery centres. WMNZ's services include:

(a) **Collection**: WMNZ provides collection services for households, businesses, and non-residential and industrial customers, with a focus on efficient and environmentally friendly waste management.

(b) **Processing**: The company operates processing facilities to sort and treat waste, including recycling facilities and composting plants.

(c) **Disposal**: WMNZ provides safe and secure disposal options, including at modern engineered landfills and transfer stations.

(d) **Resource Recovery**: The company is involved in resource recovery, which involves collecting and processing waste materials to extract valuable resources.

(e) **Education and Training**: WMNZ provides education and training services to promote sustainability and waste reduction, including programmes for schools and businesses.

(f) **Landfil**l **waste to energy plants**: WMNZ owns and operates three landfills that convert landfill gas to energy to power the equivalent of 24,000 homes.

2.3 These services represent a coherent infrastructure network for waste, from the collection of waste, through separation, processing and treatment of valuable recyclables or compostable matter, to ultimate safe disposal of the residual components of the waste streams that are generated by households, communities, commercial and industrial activities across the public and private sectors. WMNZ operates across the entire waste network. WMNZ owns and operates waste infrastructure, including refuse transfer stations, materials recovery facilities (eg for tyres and concrete), solid waste treatment plants, sorting and consolidation lines, composting sites, landfills and energy recovery parks. At a high-level waste can be categorised as solid or liquid waste, which include organic and hazardous wastes, with degrees of complexity and specialisation within each. WMNZ safely manages all of these categories across its waste infrastructure network.

2.4 WMNZ also played a central role in processing waste following the Canterbury and Kaikoura earthquakes. In 2023 WMNZ provided critical assistance following the floods in Auckland and continues to work on the recovery effort following Cyclone Gabrielle in Auckland and Tairawhiti/Hawkes Bay area.

2.5 WMNZ is committed to undertaking all of the waste services described above to the highest standards. WMNZ is committed to net-zero carbon outcomes and alignment with the Climate Change Response Act, with the intention of contributing to a climate-positive future for New Zealand.

2.6 We achieve this by assessing the carbon-impacts of our infrastructure and operations and taking active steps to mitigate and address these. For example, WMNZ is the largest producer of renewable energy in Auckland, capturing over 90% of the landfill gas at our sites to power the equivalent of 24,000 homes. We are also electrifying our waste collections vehicle fleet. WMNZ has also been an advocate for the closing or improvement of historical dumps with sub-standard lining, gas-capture or other operation systems across New Zealand, particularly through the late 1990s and early 2000s as the resource management system came into force and encouraged better landfilling practices.

2.7 We make substantial investments into investigating and developing new and low carbon resource recovery technologies.

2.8 Aotearoa New Zealand is starting to feel the very real impacts of the climate crisis. Our team was called upon to help clean-up in the aftermath of this year's Auckland Anniversary Weekend flooding and Cyclone Gabrielle, and the impact on our people and communities has made WMNZ more determined than ever to take a leadership role in fighting climate change.

3. COMMENTARY ON THE REVIEW

3.1 Currently NZ ETS scheme does not distinguish between emission reductions and removals. The review proposes changes that would strengthen the incentives for gross emissions reductions in the NZ ETS scheme. The Climate Change Commission ("**the Commission**") has recommended that the government consider how the NZ ETS scheme may be amended

to provide more robust support for gross emissions reductions and manage the amount of exotic forest planting it drives.

3.2 The proposed changes as set out in the review give rise to certain issues in WMNZ's view.

3.3 The gross emissions reductions are already occurring under the current ETS settings, a higher price will not necessarily result in improved outcomes. The ETS scheme is one lever in our view in the arsenal that is NZ's climate policy. In WMNZ's view capital and technological challenges and constraints have a more discernible impact on emission reductions than increasing the carbon price further.

3.4 The ETS review is seeking to find ways to increase the carbon price for gross emissions without considering the wider range of issues that impact on the price of carbon credits in a market such as New Zealand/Aotearoa. The commonly held view is that unless action is taken, the volumes of forestry credits coming into the market will exceed demand by the mid-2030s, even though there will still be significant net emissions (because of the large amount of emissions that are outside the ETS scheme or given free allocations). The view that that this outcome will lead to a collapse in the carbon price forms the basis for the proposed review and concern that gross emissions will not decline as needed to meet the country's emissions targets.

3.5 Respectfully, in WMNZ's view, the underlying assumptions need to be challenged. Statements that need to be challenged include assertions that suggest the current ETS carbon prices are too low to encourage emitters in the energy, transport, industrial processes, and waste sectors to reduce their emissions. This is simply not supported by facts.

3.6 WMNZ does not accept the premise that a higher ETS price is necessary to drive gross emission reductions. Waste emissions have declined every year since 2005 and are at their lowest level since official records started in 1990. In the decade to 2021, waste emissions fell 14.0% (AR5) and solid waste emissions fell 18.3%.

3.7 As of 2021, waste sector emissions had already reduced to the extent that they were two years ahead of the then policy targets as set out in the Commission's model at that time. Quarterly data for the electricity, gas, water, and waste services sector suggests this downward trend has continued into 2022. Fluctuations in the ETS carbon price have not affected this trend.

3.8 Whilst the ETS scheme is an important tool, it is not the only tool. The review appears to suggest that the ETS scheme is the most impactful tool thereby supporting higher carbon pricing. In WMNZ's view this view is without merit. Whilst high carbon pricing appears impactful, it does not incentivise behaviour change, in particular not in the waste sector. The additional cost imposed does not lead to any significant carbon reduction.

3.9 It is evident that carbon pricing is not a singular cause for the reduced carbon emissions from the waste sector. Good business practices require decisions that reduce environmental impacts. As the largest participant in the waste sector, WMNZ conducts its business as responsible participant. WMNZ takes steps to reduce its carbon footprint by investing in technology and employing practices that drive sustainable solutions, for its customers and as a business.

3.10 Below we outline WMNZ's view on each of the options proposed in the scheme and set out which option we support.

4. OPTIONS ANALYSIS

Option 1: Use existing NZ ETS levers to strengthen incentives for net emissions reductions

4.1 **Change:** The government could reduce the supply of NZUs, and therefore reduce net emissions through existing levels such as auction volumes, price controls, or industrial allocation. This option would involve amending the Climate Change Response Act 2002 to require the government and where appropriate the Commission to also consider the incentive for gross emissions reductions or the supply of forestry units before changing these regulations.

4.2 **Impact:** Increase price in the short term, incentivise participants to reduce gross emissions. This is ineffective in medium to long term and gives rise to two issues"

(a) **Issue 1:** More costly to the economy. This is because reducing the volume of NZUs released by the government, which sets the overall NZ ETS cap, would effectively mean reducing net emissions faster than required by our emissions budgets.

(b) **Issue 2**: Increased incentive for removal activities will likely dampen the price in the medium to long term, reducing the incentive for gross emissions reductions.

4.3 The assumption that reducing the supply of NZUs automatically reduces net emissions is questionable. Gross emissions are already falling. The government has rejected the Commission's recommendation for higher auction prices and tighter auction volumes because it cannot justify putting those costs on to households and businesses, when emissions are already falling.

4.4 WMNZ does not support option 1.

Option 2: Create increased demand for removal activities to increase net emissions reductions

4.5 **Change:** New entities will be able to purchase NZUs outside the NZ ETS. The government could purchase NZUs to support achievement of the NDC, and offshore buyers might purchase them to meet voluntary emissions targets or support voluntary market claims. This option involves legislative or policy changes to increase the opportunities to sell NZUs allocated from removal activities.

4.6 **Impact:** Theoretically, this option will reduce the number of NZUs that emitters can access in the secondary market. This will incentivise gross emissions reductions because increased demand in the secondary market will likely increase the NZU price. This increase in price is also likely to incentivise increased removal activities. This option give rise to the following issue:

(a) **Issue:** Effectiveness of this option is limited due to:

i. NZUS for purchase may not meet international standards;

ii. Countries seeking to use purchased units towards their NDCs will require units to be adjusted to ensure the same removals are not counted twice; and

iii. It gives rise to the uncertainty of demand for unadjusted units in voluntary carbon markets.

4.7 Whilst WMNZ support's the government buying New Zealand sequestration emissions rather than credits from overseas, some consideration ought to be given to whether funding other economies is sensible. WMNZ does not consider that this option would encourage emitters in the energy, transport, industrial processes, and waste sectors reduce emissions.

Option 3: Strengthen incentives for gross emissions reductions by changing the incentives for removals

4.8 **Change:** This option will create two prices: one for emissions reduction activities and another for removal activities. This can be achieved through various ways such as:

(a) Imposing restrictions or conditions on the units that NZ ETS participants can surrender as part of the surrender obligations generated through removal activities;

(b) Restricting the number of units that can be allocated from removal activities; and

(c) Restricting the time removal units can be held to be as aprt of an emitter's surrender obligation.

4.9 **Impact:** The impact will be that a lower price will apply to removal activities, making them less financially attractive. The prices for reductions and removals will still be linked because an increase to the price of units sold at auction will likely increase the price paid for removal activities. This option results in the following issues in WMNZ's view.

(a) **Issue 1:** The success of option 3 is dependent on the restrictions imposed and in absence of additional policy interventions, this option is likely to decrease demand for units allocated for removal activities and therefore reduce the incentive to invest in additional removal activities.

(b) **Issue 2:** The option is not expected to increase NZ ETS contribution to Aotearoa New Zealand's NDC. This option is likely to increase the proportion of gross reductions, but these gains will be counterbalanced by the reduced incentives for removal activities.

4.10 In summary option 3 proceeds from the assumption that a higher ETS price is needed to drive gross emissions reductions, contrary to the evidence. It is capital costs and, sometimes, limited supply of green technology and innovation funding that is constraining emissions reductions.

4.11 The current ETS scheme and other factors, including sustainable business practice to reduce emissions is already sufficient to create the ambition to reduce emissions. It is a matter of technology and the funding that is hampering innovation in a market the size of New Zealand/Aotearoa.

Option 4: Create separate incentives for gross emissions reductions and emissions removals.

4.12 **Change:** This option would create two markets with two separate prices, one for gross emissions reduction activities and another for removal activities. This would involve a combination of changes such as:

(a) The government directly purchasing removals;

(b) Private entities purchasing credits on a mandatory basis; or

(c) Private entities purchasing credits on a voluntary basis.

4.13 **Impact:** This option would create two markets with two separate prices. One for gross emission reduction activities and another for removal activities. Emitters would no longer be able to use units allocated for removal activities to meet their surrender obligation for their gross emissions. A separate market would incentivise removal activities. This option results in the following issues:

(a) **Issue 1:** Increased costs to ethe economy and households: Increased costs of NZU prices and emissions would likely to be passed onto consumers especially transport and energy which disproportionately affects lower income households

(b) **Issue 2:** This option largely continues to focus on the ETS scheme as a key contributor to the emissions reduction policy position.

4.14 Whilst not ideal, option 4 is one the WMNZ would support. WMNZ is already capturing significant emissions and is a leader in the waste and transport sectors. WMNZ invests heavily in reducing its carbon footprint and provides educational support to its customers to reduce theirs.

4.15 WMNZ considers out of four options, option 4 is the only one that has the potential to drive behaviour change as the differential pricing allows those market participants who have invested in technology to benefit from that investment rather that treat it as a sunk cost with no additional benefits. This option is also likely to incentivize future investment in green technology.

5. PLANTING INCENTIVES

5.1 WMNZ is supportive of indigenous planting being included in the ETS credit scheme. WMNZ works with mana whenua closely and planting projects that add value to off-setting our emissions are a key component to looking after the land.

5.2 WMNZ notes that one improvement that could be made is to ensure that the credit scheme for indigenous planting is available whether or not such planting is required through a resource consent as part of any off-set planting to mitigate the adverse effects of a project. At present, if indigenous planting is required as a condition of a resource consent, such planting is excluded from the ETS scheme. There is no policy or regulatory basis for this position. It does not incentivise long term behaviour change.

5.3 If indigenous planting were included in the ETS scheme, regardless of the basis or reasons for such planting it would result in a net positive outcomes for the environment. Apart from off-setting emissions, it would result in increased biodiversity effects and community engagements, particularly with mana whenua.

6. SEQUESTRATION ON LANDFILLS

6.1 WMNZ's supplementary view is that there should be statutory recognition of sequestration. Carbon sequestration is a naturally occurring process which can be enhanced or achieved with technology, for example with carbon capture and storage projects such as the current way in which WMNZ captures carbon on its landfills.

6.2 WMNZ captures landfill gas and converts it to energy creating enough energy to power the equivalent of 24,000 homes. These energy projects capture over 90% of the methane generated within landfills with the captured gas used beneficially, resulting in a material reduction in emissions and in the displacement of fossil fuel-derived natural gas.

7. EMISSIONS SHIFTING

7.1 WMNZ has significant experience waste processing. WMNZ would discourage a move to the transportation of organic waste to waste reprocessing plants. This activity generates significant additional transport emissions without any significant emissions reductions.

7.2 WMNZ would also caution against waste to energy incineration as there are no emission gains from this method of waste management. Additionally, incinerators will emit more toxins and pollutants that harm local air quality. Incineration makes a more significant negative contribution to local air quality than a landfill without any real emissions gains – arguably the net result is additional adverse environmental effects from incineration.

He tono nā

Te Rūnanga o NGĀI TAHU

ki te
MINISTRY FOR THE ENVIRONMENT
me
MINISTRY FOR PRIMARY INDUSTRIES

e pā ana ki te
REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME
me
A REDESIGNED NZ ETS PERMANENT FOREST CATEGORY

23 August 2023

contact person:
Jasmine Mouat I Acting General Manager | Strategy & Influence I Te Rūnanga o Ngāi Tahu
[redacted] I [redacted] I PO Box 13-046 I Christchurch

1. INTRODUCTION AND EXECUTIVE SUMMARY

1.1 Te Rūnanga o Ngāi Tahu (**Te Rūnanga**) welcomes the mahi being undertaken by the Ministry for the Environment (**MfE**) on the review of the Emissions Trading Scheme (**ETS**) and by the Ministry for Primary Industries (**MPI**) on the redesigning of the ETS permanent forest category.

1.2 Climate change adaptation is of utmost importance for Ngāi Tahu as the mana whenua of the largest geographical area of any iwi. Forestry has an important role to play in Aotearoa's climate change response. However, it remains important that climate change policies lead to the right forests in the right places to support social, cultural, economic, and environmental objectives.

1.3 Overall, Te Rūnanga supports proposals that will enable the ETS to be an effective mechanism for incentivising gross **and** net emission reductions, whilst also enabling our communities to build resilience through economic prosperity and sustainable land management.

1.4 It remains important that the Crown engages meaningfully with iwi and hapū on this kaupapa, particularly in cases where there is the risk of devaluing Treaty Settlement Assets.

2. TE RŪNANGA O NGĀI TAHU

2.1 This response is made on behalf of Te Rūnanga which is statutorily recognised as the representative tribal body of Ngāi Tahu whānui and was established as a body corporate on 24 April 1996 under section 6 of the Te Rūnanga o Ngāi Tahu Act 1996 (**TRONT Act**).

2.2 Te Rūnanga encompasses 18 Papatipu Rūnanga, who uphold the mana whenua and mana moana of their rohe. Te Rūnanga is responsible for managing, advocating, and protecting the rights and interests inherent to Ngāi Tahu as mana whenua.

2.3 Te Rūnanga expects that MfE and MPI will accord this response with the status and weight of the tribal collective of Ngāi Tahu Whānui, which includes over 78,000 registered iwi members in a takiwā comprising the majority of Te Waipounamu. A map of the Ngāi Tahu Takiwā is included at **Appendix One**. Ngāi Tahu and Ngāi Tahu Whānui means the collective of individuals who descend from the primary hapū of Waitaha, Ngāti Mamoe, and Ngāi Tahu, namely, Kāti Kurī, Kāti Irakehu, Kāti Huirapa, Ngāi Tūāhuriri, and Kai Te Ruahikihiki.

2.4 Notwithstanding its statutory status as the representative voice of Ngāi Tahu whānui "for all purposes", Te Rūnanga accepts and respects the right of individuals and Papatipu Rūnanga to make their own responses in relation to this matter.

Te Rūnanga o Ngāi Tahu and Ngāi Tahu Forestry interests

2.5 Te Rūnanga, through Ngāi Tahu Forestry, owns approximately 1,100 hectares of ETS-registered post-1989 forest land on the West Coast of the South Island planted between 1997 and 2007. In addition, Ngāi Tahu Forestry owns approximately 3,000 hectares of

post-1989 production forest and approximately 25,000 hectares of pre-1990 production forest across the takiwā.

2.6 This substantial holding is a result of the complex historical circumstances that have shaped the land holdings of Te Rūnanga into what they are today. It is also partly the result of the complex historical relationship of Ngāi Tahu with the Crown, including the Ngāi Tahu Settlement. For this reason, Ngāi Tahu, like many iwi, have a distinct relationship to our forests, and the forestry industry. We consider that this distinct relationship uniquely qualifies Te Rūnanga to comment on the implications of the proposals contained in the discussion documents for our forests and Māori forestry.

3. TE TIRITI O WAITANGI AND PARTNERSHIP

3.1 The contemporary relationship between the Crown and Ngāi Tahu is defined by three core documents; the Treaty, the Ngāi Tahu Deed of Settlement 1997 and the Ngāi Tahu Claims Settlement Act 1998 (**NTCSA**). These documents form an important legal relationship between Ngāi Tahu and the Crown and entrench the Treaty partnership.

3.2 As recorded in the Crown Apology to Ngāi Tahu (see **Appendix Two**), the Ngāi Tahu Settlement marked a turning point, and the beginning for a "new age of co-operation". In doing so, the Crown acknowledged that Ngāi Tahu holds rangatiratanga within the Ngāi Tahu takiwā. The Crown Apology also acts as a guide for the basis of the post-Settlement relationship between Ngāi Tahu and the Crown and as such, underpins this response.

4. IMPACTS OF CLIMATE CHANGE

4.1 As an iwi, Ngāi Tahu views the world through an intergenerational lens. Te Rūnanga is guided by the whakataukī - "Mō tātou, ā, mō kā uri a muri ake nei" (for us, and those that come after us) - which is particularly relevant in the context of climate change.

4.2 Climate change adaptation is of utmost importance for Ngāi Tahu as the mana whenua of the largest geographical area of any iwi in Aotearoa New Zealand.

4.3 The effects of a changing climate will impact the whole spectrum of Ngāi Tahu interests, assets and activities. Some of those impacts include:

a. Changes to coastal ecosystems due to sea level rise and extreme weather events.

b. Increasing acidification of oceans, which is affecting ecosystems including key kaimoana species.

c. Changing patterns of local species which are impacting Ngāi Tahu practice of mahinga kai and rongoā (traditional medicine) plant crops.

d. Increasing food and freshwater security risks in areas affected by frequent weather events.

4.4 Te Rūnanga has been considering the impact of climate change on the Ngāi Tahu takiwā and its people for generations. Ngāi Tahu whānui have always adapted their way of life to their environment.

4.5 Te Rūnanga released its Climate Change Strategy *He Rautaki Mō Te Huringa o Te Āhaurangi*[1] in 2018. The Strategy informs our decisions and actions to future-proof all tribal assets, interests, and activities, and to ensure that Ngāi Tahu Papatipu Rūnanga and whānau are supported to respond effectively to the impacts of climate change.

4.6 Te Rūnanga launched its Climate Change Action Plan, *Te Kounga Paparangi*, in 2022. *Te Kounga Paparangi* sets out commitments and tangible actions to reduce our emissions profile, adapt to climate challenges and maximise opportunities afforded to us. Delivery of the 88 actions identified in this Plan are actively monitored and reported on. Under *Te Kounga Paparangi*:

We aim to emit net-zero greenhouse gas emissions from operational activities and our energy consumption. This means our total greenhouse gas emissions less any emissions are permanently sequestered or adequately offset.[2]

4.7 The emissions reduction actions in *Te Kounga Paparangi* were developed in the context of a well-functioning ETS.

5. GENERAL COMMENTS

5.1 Te Rūnanga notes that the strong Māori interest in the ETS and the need to give effect to Te Tiriti has been acknowledged in the discussion documents. However, it is disappointing that the Crown has not engaged directly with its Te Tiriti partners prior to its public consultation process. Te Tiriti partners are not just stakeholders. Te Rūnanga expects all Crown agencies to undertake all aspects of their work programmes in accordance with the Crown's obligations as Te Tiriti partner of Ngāi Tahu. This includes proactively partnering with Te Rūnanga and utilising the different layers of government to engage with Papatipu Rūnanga. This approach must be used at the earliest possible stage for policy development and legislative amendments, not only to identify the issues, but also to co-design and develop solutions that are consistent with Ngāi Tahu rangatiratanga in the Ngāi Tahu Takiwā. This is particularly critical when anticipating significant Crown initiatives or reform work.

5.2 Working in cooperation and partnership with Ngāi Tahu in developing and implementing policy is required by the Crown's own Te Tiriti commitments under Cabinet Office Circular CO (19) 5. Ngāi Tahu rangatiratanga means that pan-Māori or other organisations are not a proxy for the Crown's engagement as a Te Tiriti partner.

5.3 Te Rūnanga recently published guidance for Crown engagement with Ngāi Tahu on its website. These documents provide clear guidelines for when the Crown, including Ministers, departments, agencies, and boards that engage with Ngāi Tahu. They describe what partnership looks like in the Ngāi Tahu context; outline the contemporary Ngāi Tahu / Crown relationship; and describe what Ngāi Tahu rangatiratanga is. They also provide examples of good engagement and include a map of the Ngāi Tahu Takiwā. Te Rūnanga strongly suggests that MfE and MPI familiarise themselves with this guidance to inform its approach to the next phases of this work programme as well as future work programmes.

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1 He Rautaki Mō Te Huringa o Te Āhaurangi , 2018, accessible at Climate Change Strategy - Te Rūnanga o Ngāi Tahu (ngaitahu.iwi.nz)

2 Te Kounga Paparangi, 2022, accessible at Climate Change - Te Rūnanga o Ngāi Tahu (ngaitahu.iwi.nz)

5.4 Te Rūnanga notes that there has been significant consultation relating to the ETS and forestry issues by the Crown over the last two years. This has had an impact on forestry planning and planting due to the uncertainty these reforms and changes have created. The ongoing end extended reform programme further exacerbates this uncertainty.

5.5 The timing of the Crown's ETS review seems out of sync and disconnected from other climate change mahi. For example, this ETS review discussion document, addressing the recommendations made in the first report by He Pou a Rangi Climate Change Commission (**CCC**), was released one day after the CCC-led consultation on the second emissions reduction plan closed. This makes it challenging to determine the effectiveness of proposed options or to make evidence-based recommendations. It also creates additional pressure on the capacity and capability of technicians to respond to these complex discussion documents – an issue particularly felt by iwi/hapū with already limited capacity.

5.6 The ETS is one tool among many in New Zealand's Climate Change Response and in order to ensure the effectiveness of its policy settings, it needs to be carefully considered in relation to other legislative and policy instruments, and with reference to an appropriately delineated timeframe. Without such a coordinated and long-term focus, there is a risk that any changes made to the existing policy settings will not only fail to produce their intended outcomes but may also bring unintended consequences.

5.7 Furthermore, and noting the significant amount of government consultation on various related (and unrelated) workstreams, there is a very real risk of consultation fatigue, leading to disjointed and seemingly apathetic responses. Te Rūnanga notes that the decision by many to not provide a response to these consultation documents does not imply tacit endorsement of the policy positions.

6. TE RŪNANGA RESPONSE TO THE REVIEW OF THE ETS

6.1 Te Rūnanga welcomes the objective of a strong carbon price signal that is sought through the NZ ETS review. However, the pace of the transition and the ability to collectively ensure it is an equitable one needs to be balanced. Without consideration of the speed of carbon price rises, there is a potential risk for detrimental impacts on whānau and on sectors that do not currently have alternative technology options available to them to decarbonise.

6.2 We recommend the government maintains a parallel focus on complementary policy measures to support social, cultural, economic and environmental objectives that can mitigate some of these impacts during the transition alongside efforts to improve the effectiveness of the NZ ETS.

6.3 Relatedly, Te Rūnanga notes that the development of the Equitable Transitions Strategy has apparently been paused, with no date provided for when it might be resumed. This is a further example of interconnected work programmes falling out of step with each other. Te Rūnanga is hopeful that the Equitable Transitions Strategy mahi will be restarted shortly.

NZ ETS changes are significant for Māori

6.4 For the government to ensure the role of mana whenua as kaitiaki and rangatira and the

principles of the Treaty of Waitangi are given effect to, engagement needs to occur directly with Te Tiriti partners at the iwi, hapū and rūnanga level.

6.5 It should not be left solely to the Government to articulate the role that forests and other emissions removals will play in achieving budgets and targets, when Māori are uniquely impacted by such decisions. For example:

a) Large areas of Māori land were returned post-settlement with pre-existing forestry in place.

b) Much Māori land is uniquely suited to afforestation as an option for productive and sustainable land use.

c) Māori have a unique, whakapapa-based relationship to the environment, including land uses that contribute to carbon removals.

6.6 Given the events that recently played out in Te Tairāwhiti from Cyclone Gabrielle, and the possibility that similar events may occur in the Ngāi Tahu Takiwā, it is imperative that Ngāi Tahu retain our optionality in any legislative and policy response to such events. This includes pathways to remove forestry from whenua that in hindsight should never have been planted, without incurring the costs associated with offsets or deforestation. We wish to note that both discussion documents do not adequately address the fact that a key component of the conversation about forestry and land-use incentives is allowing flexibility for land-use change in areas in which forestry (particularly production forestry) may not be the 'right' option.

6.7 The right of Māori to develop their lands for the benefit of their people has been affirmed by the Waitangi Tribunal as arising out of the principles of Te Tiriti. Therefore, any policy advice that seeks to place a constraint on, or otherwise hinder, this right must be carefully considered. Consideration should be given to the need to provide appropriate resource, assistance, or compensation to mitigate and/or eliminate any adverse impacts on development opportunities for Māori land that occurs as a result of particular policy decisions.

6.8 Furthermore, and given the pre-eminence of the land characteristics of each region in determining the appropriateness and possibility of specific types of carbon removal activities, we recommend that the government focus on retaining optionality for landowners, within a framework of strong environmental limits and sustainable environmental management practices. On this point, we reiterate the importance of partnership with Te Tiriti partners to develop further policy and legislative proposals. Good environmental management and consideration of appropriate environmental limits cannot occur without the input and guidance of tangata whenua.

Objectives and assessment criteria

6.9 Without a clear understanding of how the objectives and assessment criteria have been developed, it is difficult to provide commentary on the options presented. Te Rūnanga is interested in how the primary assessment criteria are considered alongside the key considerations, as there is potential for uncertainty around impacts to arise. An assessment of how this policy uncertainty is addressed would be useful.

6.10 Meeting Te Tiriti obligations should be included as an outcome assessment criterion that is a pre-requisite to considering any options for changes to the ETS.

6.11 Te Rūnanga also seeks greater clarity on how assessment criteria other than those emissions-focused criteria will be used in deciding between NZ ETS reform options. Specifically, we are interested in understanding how options have been assessed to give effect to the principles of Te Tiriti without direct engagement with Te Tiriti partners. In addition, with government acknowledging the significant impact of these reforms will have on Māori, Te Rūnanga is interested in more information about how the assessment criteria are weighted to ensure there is adequate consideration of the implications of proposed options.

Options identification and analysis

6.12 Te Rūnanga acknowledges that this discussion document is intended to provide transparency about the government's line of thought as well as gather evidence. However, without adequate analysis to consider the potential impact that the proposed changes might have on the ETS - both as a market mechanism and as a tool for meeting our domestic and international climate change targets - it is difficult to comment on the desirability of any of the options identified.

6.13 Putting forward options prior to completing adequate analysis of the potential impacts creates significant uncertainty with regards to the direction of the NZ ETS. This uncertainty has been reflected in falling New Zealand emission unit (**NZU**) prices since the announcement of the ETS review. Te Rūnanga recommends that the uncertainty caused by ongoing changes to ETS settings needs to be a significant factor in the Government's decision-making regarding the ETS Review. For the ETS to be effective at all, there needs to be a stable price and regulatory certainty.

6.14 Te Rūnanga also notes that there is a degree of political uncertainty around the proposed changes to the ETS, with the October 2023 general election mere weeks away.

6.15 In addition, Te Rūnanga expects analysis of Te Tiriti impacts to be more comprehensive than the high-level generic assessment contained within the options provided. This analysis should also incorporate an assessment of the implications in relation to Treaty Settlement assets. No options that adversely affect Māori forest owners should be considered without direct discussion with iwi/hapū as Te Tiriti Partners. As noted above, Te Rūnanga recommends a focus on retaining optionality for landowners, within a framework of strong environmental limits and sustainable environmental management practices.

6.16 Of relevance to this ETS review is the CCC's recent engagement on its draft advice for the second Emissions Reduction Plan. In its advice, the CCC recommended the government provide clarity on the intended contribution from gross emissions, including committing to specific levels of gross emissions in the second and third emissions budgets. On this point, Te Rūnanga suggests that in clarifying the role of the ETS, there must be a strong focus on the elasticity of different sectors' behaviour to emissions pricing. Te Rūnanga understands the ETS review is focussed on the ETS and incentivising gross emissions reductions, however, at times the discussion narrowly focuses on ETS settings and their influence in an analytical and isolated manner. The ETS is not a cure-all, and its participants are subject to many influencing motivations

and actions, not merely those associated with rational calculations of economic self-interest.

6.17 This is equally true for participants engaging in the ETS for the purpose of recognition of removal activities. Iwi, hapū, and Māori landowners are instructive examples of participants who cannot be usefully analysed with reference to mere calculations of rational economic self-interest.

6.18 In our own context, Ngāi Tahu brings to bear the full weight of our tikanga and ancestral values when making decisions about our whenua and our people. The ability to do so is central to our exercise of rangatiratanga and is a key reason why we are recommending that optionality in relation to land-use decisions should be a key factor in government decision-making on this issue.

6.19 The discussion document raises the possibility of vintaging (expiry of) NZUs after a defined period. Te Rūnanga has concerns about vintaging NZUs for forestry. While accepting that there is a need to manage risks associated with possible future oversupplies of NZUs to the market, we have concerns about vintaging due to the large liabilities that will accrue to owners if/when forests are felled or damaged. Due to the complexity of identifying and managing the risks associated with vintaging NZUs, Te Rūnanga is not supportive of this approach.

6.20 Te Rūnanga has concerns about any option where the government would become the sole purchaser of carbon removal units. To incentivise a desirable level of removal activities, it is likely that this approach would create significant costs to the NZ taxpayer. Te Rūnanga also has concerns that this approach would create an unnecessary barrier to iwi, hapū and Māori landowners accessing private sector funding for the sustainable development of their whenua and environmental projects that contribute to climate-resilient landscapes in their takiwā.

6.21 Te Rūnanga also notes this option brings the most significant structural change to the NZ ETS. Te Rūnanga is of the view that much further detail and analysis would be required to ensure that the risks identified above can be mitigated. Of particular concern is the lack of clarity around the treatment of NZUs currently backed by forestry.

Broader environmental outcomes and removal activities

6.22 Te Rūnanga supports strengthening incentives for removal activities that have broader environmental outcomes or co-benefits beyond carbon sequestration. However, it is also the view of Te Rūnanga that this does not necessarily need to be achieved within the ETS itself.

6.23 Te Rūnanga also supports expanding the range of permissible removal activities within the NZ ETS to include other nature-based solutions and technological forms of carbon removals that are not currently recognised.

6.24 Te Rūnanga does have concerns with how nature-based solutions would be considered in the ETS. We do not consider it appropriate for these removals to be subject to the same type of compliance and benchmarking system as was introduced via the ETS in relation to forests on private land. As nature-based solutions are not currently part of the government's climate change obligations, we consider this is an opportunity for

government to undertake genuine engagement and discussion with iwi/hapū to look at supporting an approach that is designed and owned by iwi/hapū. This is particularly important as these approaches primarily relate to Article II rights and interests.

6.25 Similarly, in relation to biodiversity outcomes, the view of Te Rūnanga is that iwi, hapū and Māori landowners are well placed to be leaders in the fight against loss of biodiversity, including in the advent of biodiversity markets in New Zealand. Te Rūnanga intends to provide a response to the government's recently released discussion document on biodiversity credits, and this perspective will be further elaborated on in that response.

7. TE RŪNANGA RESPONSE TO REDESIGNING THE ETS PERMANENT FOREST CATEGORY

7.1 Te Rūnanga is disappointed that there has been no direct engagement with Ngāi Tahu as Te Tiriti Partner prior to the release of this discussion document, especially considering the circumstances which occurred during the initial establishment of the ETS resulting in the Five Iwi Afforestation Plan (5IAP) Agreement. Officials will be aware that the Crown's ongoing failure to honour the 5IAP Agreement is a matter of significant concern to Ngāi Tahu. Furthermore, the ETS Review and Redesign of the Permanent Forest Category has recently been used in correspondence from Minister Henare, letter dated 28 July 2023, as a further reason for the Crown to delay any meaningful engagement on the 5IAP.

Indigenous forests

7.2 Due regard must be given to investment in effective and cost-efficient pathways for Māori to establish and transition to long-term indigenous forestry on their whenua. This is particularly the case with respect to land that has been, or will be, the subject of settlements under Te Tiriti. Some 80 percent of total Māori land in New Zealand is in a Land Use Capability of 6, 7, and 8[3]. Consequently, forestry is one of the only potential opportunities available to Māori to be able to generate revenue and maintain the current overheads on their land.

Land Use Capability (LUC) for Māori land			
LUC Class	**Māori Land area (ha)**	**% of Māori Land**	**Description of Land Use Capability**
1	7514.76	0.50%	Most versatile multiple-use land – virtually no limitations to arable use
2	43 733.59	2.89%	Good land with slight limitations to arable use
3	85 534.33	5.65%	Moderate limitations to arable use restricting crops able to be grown
4	153 972.29	10.16%	Severe limitations to arable use. More suitable to pastoral and forestry
5	6883.47	0.45%	Unsuitable for cropping – pastoral or forestry
6	507 706.36	33.51%	Non-arable land. Moderate limitations and hazards when under a perennial vegetation cover.
7	469 830.47	31.01%	With few exceptions can only support extensive grazing or erosion control forestry

3 https://www.landcareresearch.co.nz/assets/Events/Link-series/Unlocking_Potential_Maori_Land.pdf

8	230 142.75	15.19%	Very severe limitations or hazards for any agricultural use
Other	9752.96	0.64%	Non-arable land. Moderate limitations and hazards when under a perennial vegetation cover.
TOTAL	1 515 071.00	100.00%	

7.3 Currently, there is not a strong financial case for diversification to indigenous afforestation. Indigenous forestry management has more cost intensive requirements. It is not just about planting native species. There needs to be consideration of the environment and the species should reflect what is, or has been, in the local environment. It is also reliant on significant forward planning and research. It will also be dependent on the availability of seed sources and nursery facilities. It will take significant time and investment for the forestry industry in New Zealand to move toward models that support large-scale sustainable indigenous forestry.

7.4 If the government is wanting to incentivise indigenous afforestation and a shift towards indigenous forestry more generally, it needs to take an intergenerational approach to the issue, integrating exotic forestry into a long-term plan for transition into a productive and sophisticated forestry industry focussed on the sustainable management of significant areas of permanent indigenous forest. There are many other factors outside of the ETS that must be present for this to occur. Carbon pricing is one means by which private sector funding can be directed toward this end; however, it will be important to factor in the material and procedural changes required of the forestry industry to ensure this transition occurs in line with best forestry practice and with full industry support. In this regard, Te Rūnanga suggests that there must be clear alignment between government workstreams focussed on carbon forestry (the redesign of the ETS Permanent Forestry Category included) and the 2022 Forestry and Wood Processing Transformation Plan.

7.5 Such a transition will also be heavily reliant on investment in research and development alongside the identification of, and improved access to, new markets. A key to this is improving our knowledge of the carbon sequestration potential of various indigenous species, further supplemented by case studies and trials in different localities. On this point, we would like to suggest to officials that the ongoing attempts by Te Rūnanga and the other four 5IAP iwi to progress the 5IAP would seem like an ideal opportunity to invest in a project of sufficient size and scale to achieve the type of transformational forestry activity our nation requires.

7.6 Another key factor that Te Rūnanga would like to see explored in more detail is the interaction between species selection by foresters and current building specifications for timber. Market demand for new species will in part rely on changes to building standards to allow the utilisation of different species in building products. The current building standards do not incentivise NZ foresters to explore the use of indigenous species for timber production. This is a significant impediment to the development of further sustainable income options for landowners and foresters who choose to engage in the NZ ETS Permanent Forest Category. The discussion document identifies that one of the risks associated with a transition (from exotic to indigenous) forest is that a transition over an extended period of time may be difficult to fund. Te Rūnanga acknowledges this concern and suggests that additional income opportunities outside of the ETS must be factored into government decision-making. As mentioned above, this will require consideration of how the ETS, and the permanent forest category in particular, aligns

with wider forestry policy and the industry transformation plan. On this point, we also suggest that settings for the permanent category need to be informed by work being undertaken by the forestry sector, and Ngā Pou ā Tāne in particular, on continuous cover forestry.

7.7 Another option, not currently considered in the discussion document to incentivise the transition from exotic to permanent indigenous forestry, is reducing or removing the short-term emissions liabilities.

7.8 Overall, Te Rūnanga is supportive of the ultimate transition of permanent exotic forestry to indigenous forestry, but we will not bear the costs of that transition, particularly in relation to treaty settlement assets. Tangata whenua should not be placed in the same category as private investors and other commercial interests.

Management

7.9 It is important that all forests are appropriately managed, whether indigenous or exotic, permanent or harvested. Every species has issues and potential risks that need to be carefully considered and managed. In keeping with our responsibilities as kaitiaki, Ngāi Tahu has an interest in ensuring mahinga kai practices, taonga species and the habitats on which they depend, are in a stable, secure state of hauora.

7.10 Biosecurity risks are ever present within the sector and will need to continue to be carefully managed. The proposed species diversification will likely present new biosecurity risks particularly for species that are yet to be well established in Aotearoa. Managing these risks will be reliant on investment in research and tight biosecurity controls.

Additional comments

7.11 Overall, there needs to be a long-term vision for both the ETS and the permanent forest category to ensure policy alignment, achievable objectives and the minimisation of unintended consequences. As mentioned at the outset of this response, Te Rūnanga supports proposals that will enable the ETS to be an effective mechanism for incentivising gross AND net emission reductions, whilst also enabling our communities to build resilience through economic prosperity and sustainable land management. However, we do have concerns about the potential for more restrictive regulatory settings in the absence of clear evidence for their efficacy, and in the absence of alternative funding pathways for landowners. This is of particular concern for Māori landowners who participate in the ETS as a way to sustainably develop their land and contribute to more climate resilient landscapes.

7.12 Te Rūnanga reiterates that the uncertainty caused by ongoing changes to ETS settings needs to be a significant factor in the government's decision-making regarding the ETS Review. For the ETS to be effective at all, there needs to be a stable price and regulatory certainty.

7.13 Furthermore, administration should not be onerous on participants. Te Rūnanga is supportive of forestry management plans, however, the increasing complexity of the system should be a factor when considering any further regulation. For example, current requirements and processes do not provide enough flexibility to enable forestry to

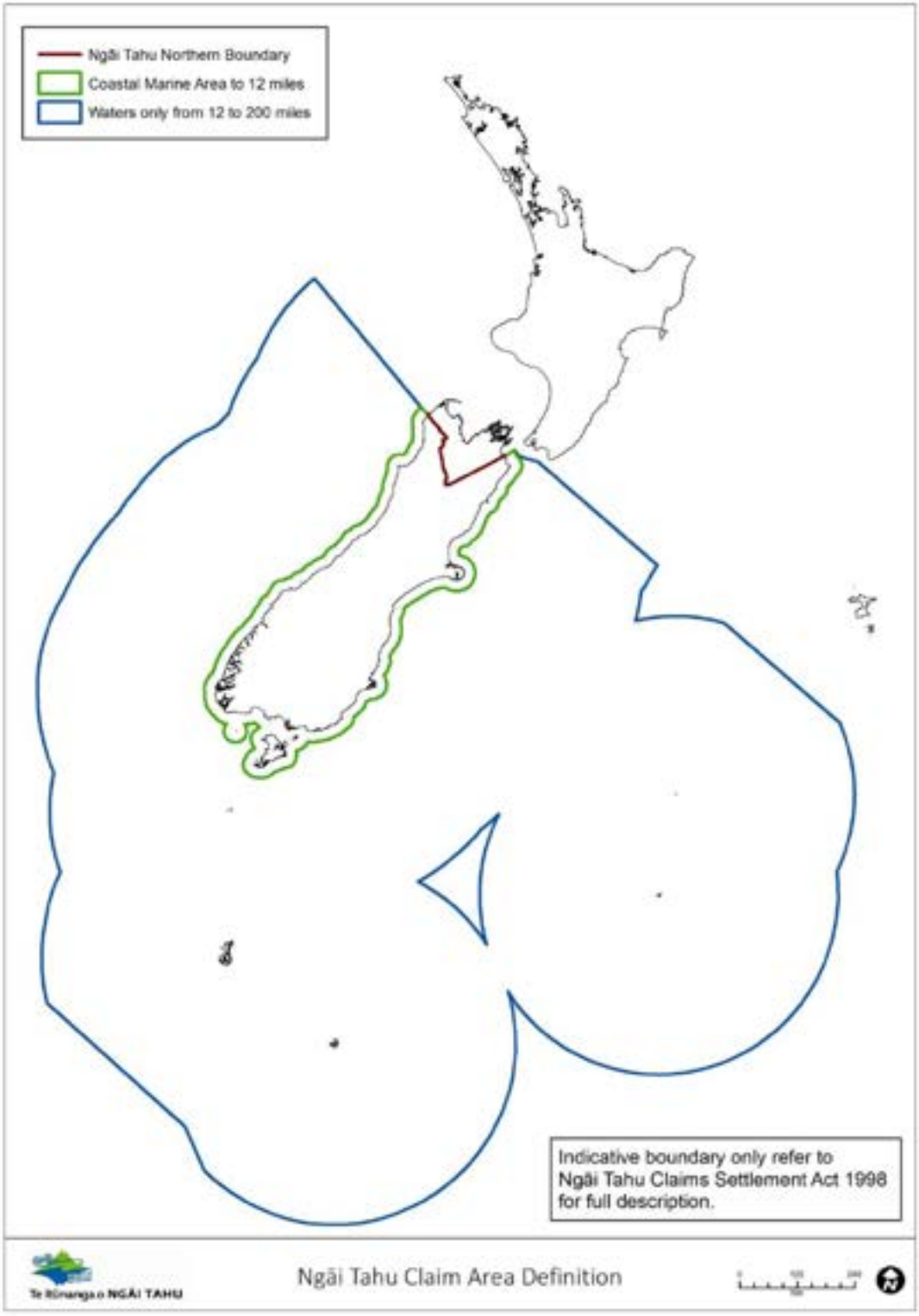
recover costs from natural events such as windthrow events.

7.14 On regulating and managing the ETS Permanent Forest Category, consideration of this issue has been made difficult due to the overlapping timeframes of the National Environmental Standards for Plantation Forestry (**NES-PF**) with this consultation. Te Rūnanga would expect that before decisions are made regarding the redesign of the permanent forest category, we will have time to consider the outcomes of the NES-PF review. The view of Te Rūnanga is that clear knowledge of these outcomes should be a key factor in considering the redesign of the permanent forest category.

7.15 We also note that MPI has recently finished seeking feedback to its consultation on extending time to re-establish forests for participants in the ETS affected by severe weather in 2023. While this is focused on providing relief to the impacts of Cyclone Gabrielle by allowing for extensions on replanting, we consider this is something that should be extended beyond the East Coast. Significant weather events are going to continue to occur, and this could enable the transition from exotic to indigenous species with the four-year requirement no longer being the benchmark. Additionally, we request similar extensions be considered due to the impacts of COVID-19.

7.16 In addition to this response, Te Rūnanga is aware that National Iwi Chairs' Forum (**NICF**) technicians have produced a submission template to support iwi, hapū and whānau to respond to this complex kaupapa. Te Rūnanga commends the NICF technicians for undertaking this analysis and initiative. We are supportive of the sentiment contained in the template (see **Appendix 3**), however we also wish to be clear that any legislation or policy affecting the Ngāi Tahu takiwā must be discussed directly with Te Rūnanga o Ngāi Tahu and provide for Ngāi Tahu rangatiratanga. As these workstreams progress, it is the expectation of Te Rūnanga that the details of any proposed solutions are developed in partnership with Ngāi Tahu. This allows Te Rūnanga to meet its responsibilities and obligations to ensure sustainable environmental, economic, social, and cultural outcomes for current and future generations of Ngāi Tahu whānui.

APPENDIX ONE: NGĀI TAHU TAKIWĀ



APPENDIX TWO: TEXT OF CROWN APOLOGY

The following is text of the Crown apology contained in the Ngāi Tahu Claims Settlement Act 1998.

Part One – Apology by the Crown to Ngāi Tahu

Section 5: Text in Māori

The text of the apology in Māori is as follows:

1. Kei te mōhio te Karauna i te tino roa o ngā tūpuna o Ngāi Tahu e totohe ana kia utu mai rātou e te Karauna—tata atu ki 150 ngā tau i puta ai tēnei pēpeha a Ngāi Tahu arā: "He mahi kai tākata, he mahi kai hoaka". Nā te whai mahara o ngā tūpuna o Ngāi Tahu ki ngā āhuatanga o ngā kawenga a te Karauna i kawea ai e Matiaha Tiramōrehu tana petihana ki a Kuini Wikitoria i te tau 1857. I tuhia e Tiramōrehu tana petihana arā: 'Koia nei te whakahau a tōu aroha i whiua e koe ki runga i ēnei kāwana... tērā kia whakakotahitia te ture, kia whakakotahitia ngā whakahau, kia ōrite ngā āhuatanga mō te kiri mā kia rite ki tō te kiri waitutu, me te whakatakoto i te aroha o tōu ngākau pai ki runga i te iwi Māori kia noho ngākau pai tonu ai rātou me te mau mahara tonu ki te mana o tōu ingoa.' Nā konei te Karauna i whakaae ai tērā, te taumaha o ngā mahi a ngā tūpuna o Ngāi Tahu, nā rēira i tū whakaiti atu ai i nāianei i mua i ā rātou mokopuna.

2. E whakaae ana te Karauna ki tōna tino hēanga, tērā i takakino tāruaruatia e ia ngā kaupapa o te Tiriti o Waitangi i roto i āna hokonga mai i ngā whenua o Ngāi Tahu. Tēnā, ka whakaae anō te Karauna tērā i roto i ngā āhuatanga i takoto ki roto i ngā pukapuka ā-herenga whakaatu i aua hokonga mai, kāore te Karauna i whai whakaaro ki tāna hoa nā rāua rā i haina te Tiriti, kāore hoki ia I whai whakaaro ki te wehe ake i ētahi whenua hei whai oranga tinana, whai oranga ngākau rānei mō Ngāi Tahu.

3. E whakaae ana te Karauna tērā, i roto i tāna takakino i te wāhanga tuarua o te Tiriti, kāore ia i whai whakaaro ki te manaaki, ki te tiaki rānei i ngā mauanga whenua a Ngāi Tahu me ngā tino taonga i hiahia a Ngāi Tahu ki te pupuri.

4. E mōhio ana te Karauna tērā, kāore ia i whai whakaaro ki a Ngāi Tahu i runga I te ngākau pono o roto i ngā tikanga i pūtake mai i te mana o te Karauna. Nā tāua whakaaro kore a te Karauna i puaki mai ai tēnei pēpeha a Ngāi Tahu: "Te Hapa o Niu Tīreni". E mōhio ana te Karauna i tāna hē ki te kaipono i ngā āhuatanga whai oranga mō Ngāi Tahu i noho pōhara noa ai te iwi ia whakatupuranga heke iho. Te whakatauākī i pūtake mai i aua āhuatanga: "Te mate o te iwi".

5. E whakaae ana te Karauna tērā, mai rāno te piri pono o Ngāi Tahu ki te Karauna me te kawa pono a te iwi i ā rātou kawenga i raro i te Tiriti o Waitangi, pērā anō tō rātou piri atu ki raro i te Hoko Whitu a Tū i ngā wā o ngā pakanga nunui o te ao. E tino mihi ana te Karauna ki a Ngāi Tahu mō tōna ngākau pono mō te koha hoki a te iwi o Ngāi Tahu ki te katoa o Aotearoa.

6. E whakapuaki atu ana te Karauna ki te iwi whānui o Ngāi Tahu i te hōhonu o te āwhitu a te Karauna mō ngā mamaetanga, mō ngā whakawhiringa i pūtake mai nō roto i ngā takakino a te Karauna i takaongetia ai a Ngāi Tahu Whānui. Ewhakaae ana te Karauna tērā, aua mamaetanga me ngā whakawhiringa hoki I hua mai nō roto i ngā takakino a te Karauna, arā, kāore te Karauna i whai i ngā tohutohu a ngā pukapuka ā-herenga i tōna hokonga mai i ngā whenua o Ngāi Tahu, kāore hoki te Karauna i wehe ake kia

rawaka he whenua mō te iwi, hei whakahaere mā rātou i ngā āhuatanga e whai oranga ai rātou, kāore hoki te Karauna i hanga i tētahi tikanga e maru motuhake ai te mana o Ngāi Tahu ki runga i ā rātou pounamu me ērā atu tāonga i hiahia te iwi ki te pupuri. Kore rawa te Karauna i aro ake ki ngā aurere a Ngāi Tahu.

7. E whakapāha ana te Karauna ki a Ngāi Tahu mō tōna hēanga, tērā, kāore ia I whai whakaaro mō te rangatiratanga o Ngāi Tahu, ki te mana rānei o Ngāi Tahu ki runga i ōna whenua ā-rohe o Te Wai Pounamu, nā rēira, i runga i ngā whakaritenga me ngā herenga a Te Tiriti o Waitangi, ka whakaae te Karauna ko Ngāi Tahu Whānui anō te tāngata whenua hei pupuri i te rangatiratanga o roto I ōna takiwā.

8. E ai mō ngā iwi katoa o Aotearoa e hiahia ana te Karauna ki te whakamārie I ngā hara kua whākina ake nei—otirā, ērā e taea i nāianei - i te mea kua āta tau ngā kōrero tūturu ki roto i te pukapuka ā-herenga whakaritenga i hainatia i te 21 o ngā rā o Whitu hei tīmatanga whai oranga i roto i te ao hōu o te mahinga tahi a te Karauna rāua ko Ngāi Tahu.

Section 6: Text in English

The text of the apology in English is as follows:

1. The Crown recognises the protracted labours of the Ngāi Tahu ancestors in pursuit of their claims for redress and compensation against the Crown for nearly 150 years, as alluded to in the Ngāi Tahu proverb ‘He mahi kai takata, he mahi kai hoaka’ (‘It is work that consumes people, as greenstone consumes sandstone’). The Ngāi Tahu understanding of the Crown's responsibilities conveyed to Queen Victoria by Matiaha Tiramorehu in a petition in 1857, guided the Ngāi Tahu ancestors. Tiramorehu wrote:

   > *“‘This was the command thy love laid upon these Governors … that the law be made one, that the commandments be made one, that the nation be made one, that the white skin be made just equal with the dark skin, and to lay down the love of thy graciousness to the Māori that they dwell happily … and remember the power of thy name.”*

2. The Crown hereby acknowledges the work of the Ngāi Tahu ancestors and makes this apology to them and to their descendants.

3. The Crown acknowledges that it acted unconscionably and in repeated breach of the principles of the Treaty of Waitangi in its dealings with Ngāi Tahu in the purchases of Ngāi Tahu land. The Crown further acknowledges that in relation to the deeds of purchase it has failed in most material respects to honour its obligations to Ngāi Tahu as its Treaty partner, while it also failed to set aside adequate lands for Ngāi Tahu's use, and to provide adequate economic and social resources for Ngāi Tahu.

4. The Crown acknowledges that, in breach of Article Two of the Treaty, it failed to preserve and protect Ngāi Tahu's use and ownership of such of their land and valued possessions as they wished to retain.

5. The Crown recognises that it has failed to act towards Ngāi Tahu reasonably and with the utmost good faith in a manner consistent with the honour of the Crown. That failure is referred to in the Ngāi Tahu saying ‘Te Hapa o Niu Tireni!’ (‘The unfulfilled promise of New Zealand’). The Crown further recognises that its failure always to act in good faith deprived Ngāi Tahu of the opportunity to develop and kept the tribe for several

generations in a state of poverty, a state referred to in the proverb ‘Te mate o te iwi’ (‘The malaise of the tribe’).

6. The Crown recognises that Ngāi Tahu has been consistently loyal to the Crown, and that the tribe has honoured its obligations and responsibilities under the Treaty of Waitangi and duties as citizens of the nation, especially, but not exclusively, in their active service in all of the major conflicts up to the present time to which New Zealand has sent troops. The Crown pays tribute to Ngāi Tahu's loyalty and to the contribution made by the tribe to the nation.

7. The Crown expresses its profound regret and apologises unreservedly to all members of Ngāi Tahu Whānui for the suffering and hardship caused to Ngāi Tahu, and for the harmful effects which resulted to the welfare, economy and development of Ngāi Tahu as a tribe. The Crown acknowledges that such suffering, hardship and harmful effects resulted from its failures to honour its obligations to Ngāi Tahu under the deeds of purchase whereby it acquired Ngāi Tahu lands, to set aside adequate lands for the tribe's use, to allow reasonable access to traditional sources of food, to protect Ngāi Tahu's rights to pounamu and such other valued possessions as the tribe wished to retain, or to remedy effectually Ngāi Tahu's grievances.

8. The Crown apologises to Ngāi Tahu for its past failures to acknowledge Ngāi Tahu rangatiratanga and mana over the South Island lands within its boundaries, and, in fulfilment of its Treaty obligations, the Crown recognises Ngāi Tahu as the tāngata whenua of, and as holding rangatiratanga within, the Takiwā of Ngāi Tahu Whānui.

9. Accordingly, the Crown seeks on behalf of all New Zealanders to atone for these acknowledged injustices, so far as that is now possible, and, with the historical grievances finally settled as to matters set out in the Deed of Settlement signed on 21 November 1997, to begin the process of healing and to enter a new age of co-operation with Ngāi Tahu.”

APPENDIX THREE: NICF TECHNICIANS' RESPONSE

1. Climate change is causing unprecedented damage to our whenua, our wai, and our communities. The health and vitality of our environment (**te oranga o te taiao**), and the authority and responsibility (**tino rangatiratanga**) to protect and restore it, is of paramount importance to us as tangata whenua. These concepts are rooted in mātauranga Māori and, as such, must be articulated and applied from a mātauranga māori lens. Our view is that our nation's response to dangerous climate change must be guided by, and provide for, these fundamental principles.

TE TIRITI CONTEXT

2. The scale of the problem of dangerous climate change means that its impacts will be felt across all aspects of our society. In the context of Te Tiriti o Waitangi, responding to this problem requires a deliberate focus on the unique circumstances of iwi Māori and our whenua. Furthermore, forming solutions to this problem requires working in partnership with us and our communities.

3. A priority for Māori in responding to dangerous climate change is ensuring that it is affordable and effective, and that it preserves and protects the relationship of iwi, hapū and Māori landowners to our whenua. Our response needs to focus on the task at hand (i.e. mitigating the impacts of dangerous climate change), whilst also enabling us to build our own resilience through economic prosperity and sustainable land management.

4. As noted in the ETS Review discussion document, it was estimated in 2018 that Māori own $4.3 billion of forestry assets, totalling approximately six percent of the total Māori asset base. Furthermore, approximately 30 percent of the 1.7 million hectares of plantation forestry in New Zealand's is on Māori land, and this is expected to grow to approximately 40 percent as Treaty settlements are completed.

5. The majority of Māori-owned land (estimated 80%)4 has a Land Use Capability (**LUC**) classification of 6,7 or 8; with approximately 46% being classified as LUC 7 or 8.

Land Use Capability (LUC) for Māori land (MLIB) compared with New Zealand LUC statistics (MLIB 2002 - TPK & NZLRI-Landcare Research New Zealand)5				
LUC Class	**% of Total NZ**	**Māori Land area (ha)**	**% of Māori Land**	**Description of Land Use Capability**
1	0.7%	7,514.76	0.50%	Most versatile multiple-use land – virtually no limitations to

4 Unlocking the potential of Māori land: A kaupapa Māori approach to using and developing integrated knowledge, models and tools MPI Link seminar, Wellington, Thursday 4th May, 2017 Garth Harmsworth: https://www.landcareresearch.co.nz/assets/Events/Link-series/Unlocking_Potential_Maori_Land.pdf

5 Ibid.

				arable use
2	4.55%	43,733.59	2.89%	Good land use with slight limitations to arable use
3	9.22%	85,534.33	5.65%	Moderate limitations to arable use restricting crops able to be grown
4	10.5%	153,972.29	10.16%	Severe limitations to arable use. More suitable to pastoral and forestry
5	0.8%	6,883.47	0.45%	Unsuitable for cropping – Pastoral or forestry
6	28.1%	500,706.36	33.51%	Non-arable land. Moderate limitations and hazards when under a perennial vegetation cover.
7	21.4%	469,830.47	31.01%	With few exceptions can only support extensive grazing or erosion control forestry
8	21.8%	230,142.75	15.19%	Very severe limitations or hazards for any agricultural use
Other	3.0%	9,752.96	0.64%	Non-arable land. Moderate limitations and hazards when under perennial vegetation cover.
TOTAL	100.00% (26,930,100 ha)	1,515,071.00	100.00%	

6. Much of this land has been passed down from traditional owners; with the rest being either returned to iwi through formal Treaty Settlements with the Crown, through legal processes other than formal Treaty Settlements, returned through some other less formal means, or purchased outright.

7. A key principle for us is ensuring that our nation's response to dangerous climate change does not compound historic injustices on our people and risk a disproportionate impact on our communities, including as it relates to whenua Māori and present or future treaty settlement assets.

STRATEGIC PRIORITIES

8. At the highest level, it is preferable that the nation's climate change response, and the ETS's role within it, include as many strategic co-benefits as possible. This includes:

   (a) Fully valuing ambitious emissions reductions and forestry removals, achieving these at least cost to the taxpayer and ratepayer, and managing impacts on communities.

   (b) Maximising synergies between climate change mitigation and climate change resilience and adaptation. Here, for example, strategically designed forestry policy can deliver removals by means of land use change and climate resilience at no or low cost to the ratepayer or taxpayer.

9. Aotearoa needs to significantly reduce its gross greenhouse gas emissions. Current policy must be strengthened to drive deeper and faster emissions reductions. But it is also clear that gross emission reductions alone will not enable the country to achieve these goals. We also need to remove as much CO2 from the atmosphere as possible through carbon sinks. We also note that some emissions are either prohibitively expensive or impossible to abate in gross terms. These difficult-to-abate emissions should be managed through carbon offsetting and removals. As such, we believe that a robust national emissions management system needs to include gross and net emissions accounting. The NZ ETS and wider policy ecosystem, therefore, should operate in the service of both gross emission reductions and emissions removals.

10. In relation to forestry removals, we require an affordable climate change response in which GHG removals are delivered in a manner that:

   (a) Is sufficiently financially viable and has the long-term stability to attract investment and deliver financial returns on that investment.

   (b) Provides rural employment opportunities for Māori.

   (c) Maximises rural economic development for Māori, particularly with respect to economically challenging lands remaining in Maori ownership or those received through the Treaty Settlement Process.

   (d) Focuses on optionality so that Māori landowners can make decisions regarding the sustainable development of our land according to our own tikanga.

   (e) Enables a financially viable option to build climate resilient landscapes on erosion prone lands, maximising use of commercial investment to achieve this.

   (f) Helps to encourage transformation in the New Zealand forestry industry towards continuous cover forest systems, with their associated environmental co-benefits.

   (g) Makes the reforestation and regeneration of ngahere financially viable, particularly on land where clear-cut harvesting and/or pastoralism is

inappropriate.

(h) Aligns with, and enables the pursuit of, broader aspirations relating to the protection and restoration of biodiversity.

EMISSIONS PRICING AND THE ETS

11. Carbon pricing is a mechanism to drive behaviour change across an entire economy. Such pricing will only drive the desired change if the price is high enough to function as a meaningful price signal for the target sector, stable enough for that sector to incorporate this price into their business models and focused on those who have the ability to change in response to the price.

12. On this point, **we recommend that a desired outcome of this review should be that the carbon price in the market should be sufficiently high to deliver the necessary emissions reductions.** For example, the Climate Change Commission and the Treasury (in their Shadow Emissions Prices) have attempted to calculate a sufficient price: this could provide a benchmark.

13. Further to the need for an ETS carbon price signal aligned to the social cost of GHG pollution, **we recommend that another key outcome of this review should be aimed at achieving a carbon price signal that is stable and consistent enough over the long-term to support the type of long-term investments, both in emissions reductions and in forestry, required to enable New Zealand's transition to a low-carbon climate resilient future.**

14. However, **it is essential that ETS design does not simply lead to ineffective pass-through of prices that only increase energy costs, disproportionately affecting Māori.** The ETS must create a real incentive for companies to invest in cleaner technologies and for forestry investment.

15. Lastly, and to complement the above, we strongly suggest that the ETS needs to be properly situated within an ecosystem of climate change policy instruments that work with the carbon price signal in incentivising a low-carbon and climate resilient future, while also managing the costs and impacts of the transition on communities and whānau. For this reason, **we recommend the review of the ETS is viewed in direct relationship to complementary policy instruments that focus on strategic incentives for investment in clean technology and clean development, disincentives for investments in dirty technology and dirty development, and strategies to support community-led transitions.**

REMOVAL INCENTIVES

16. In our view, retaining strong incentives for removal activities is of fundamental importance to achieving an effective climate change response, complementing rather than displacing the need for strong gross emissions reductions. There are many emission types that are either physically impossible to eliminate/reduce or prohibitively

expensive to deliver. For example, agricultural emissions whether from soils, fertilizers, or ruminant animals may need to be offset.

17. Removal activities will also provide important benefits in the form:
    (a) Reducing the volume of abatement to be purchased offshore in current and future international targets.
    (b) Enabling the critically important reforestation of around 1 million hectares of erosion-prone pasture and marginal land into permanent forest for climate resilience.
    (c) Assisting in the pursuit of broader aspirations relating to the protection and restoration of biodiversity.

ACHIEVING BOTH GROSS REDUCTIONS AND REMOVALS: RESPONDING TO THE ETS REVIEW CONSULTATION OPTIONS

18. We are cognisant that one component of supporting an ETS that is able to contribute to achieving both gross emissions reductions and forestry removals is consideration of the volume of NZUs made available to the ETS market through removal activities (i.e. forestry), and what effect this volume could have on the carbon price signal and level of gross emission reductions over time.

19. The discussion document outlines concerns in this regard relating to a potential future oversupply of NZUs to the market, and a subsequent crash in the carbon price signal due to projected afforestation rates in response to a high carbon price signal in the short-term. Without going into detail and repeating criticisms that will no doubt appear in other submissions; our networks inform us that the government's use of the Intentions Survey to inform modelling for projected planting rates and NZU prices is highly contested.

20. We understand that the volume of NZUs made available to the market through removal activities is a lever that could be adjusted to amplify the impact of the carbon price signal and drive more reductions in gross emissions. However, our view is that

    (a) there is currently an unacceptable level of uncertainty surrounding the projections and modelling the government is relying on to identify and scope the problem which the ETS Review is setting out to remedy. This is further complicated by the fact that it is not at all clear that we have a good understanding of what future demand dynamics for carbon removals might look like if, for example, agriculture is included in the ETS, and/or opportunities become available for the export of carbon removal units. We also note that net-zero by 2050 is a short-to-medium-term goal and that a long-term goal would be to achieve a net-negative emissions profile; and

    (b) any reform proposal must address <u>both</u> how gross emissions reductions will be incentivised <u>and</u> how support for the necessary level of forestry removals will be

provided. The consultation document focuses on the former and largely ignores the latter.

21. Overall, we are not satisfied that the government has a clear, principled, and cohesive vision informing its attempts to address this issue. This has led to a situation in which removals from forestry have come to be seen as a divisive political problem rather than a sensible and important climate change solution.

22. The four options in the consultation are not presented in sufficient detail to enable us to provide a meaningful assessment or comparison. We see them as essentially a grab-bag of ideas that would each deliver different results, highlighting the government's lack of clear vision.

23. In summary, **we recommend that in its next steps, the government should use existing levers AND increase incentives for gross emission reductions, AND reduce the expected volume of offshore mitigation, AND improve the removals facility by directing removals towards building climate resilient landscapes.**

24. We believe that solutions to these challenges can be developed in a constructive manner that upholds the key principles and priorities we have outlined in this document, including the fundamental principle of compliance with Te Tiriti o Waitangi. However, this will require the Crown to co-design solutions with iwi, hapū and Māori landowners, as well as Māori forestry and agriculture experts.

PERMANENT FORESTRY

25. The country needs to build climate resilient landscapes, particularly in erosion-prone parts of NZ. This will inevitably require a shift away from pastoralism and clear-cut plantation forestry in sensitive regions (e.g., Tairawhiti, Hawkes Bay, Whanganui District, Ruapehu District, Northland, Tasman District). This amounts to the need to replace existing land use with permanent forests for around 1 million hectares of land.

26. This will require replacing clear-cut forestry and pastoral farming on hundreds of thousands of hectares of erosion lands with an economically viable alternative. The most practical alternative that will not crash rural land value is continuous cover forestry.

27. Continuous cover forestry does not clear cut the forest but instead either does not harvest, or harvests individual trees, groups of trees, patches, or strips in an on-going cycle of harvest and replacement. This approach is common in other countries including federal forests in the US, many developing countries, and around 30% of all forestry in Europe. Lands too steep for any harvesting can be planted in native trees and managed for conservation, the cost and maintenance of which would either be built into the continuous cover forest operation as a whole and/or supplemented by government policy or financial incentives.

28. Maximising the role of private investment matters. For a local example, reforesting 1 million ha in rural Aotearoa with native forest using government grant funding would cost the taxpayer around $25 billion. Reforesting the same 1 million ha with continuous cover exotic forests using a well-functioning NZETS (and wider set of buyers for forestry removals) could cost the taxpayer $0.

29. **We believe that the source of removals needs to be directed in the first instance towards activities and geographies that maximise the delivery of climate resilience co-benefits. We recommend that a core element of this approach would be continuous cover permanent forestry in erosion-prone landscapes and land classes. Such continuous cover forestry should include options for exotic continuous cover productive forestry, exotic continuous cover forestry transitioning to native forest, native continuous cover productive forestry, and permanently protected native forest appropriate to the land type.**

30. This approach would enable much needed land use change on these lands at no or low cost to the taxpayer. It would also help to create an economically viable alternative to pastoralism or clearcut forestry on these lands – activities that have proven to create substantial contingent liability risks to downstream and downslope property, infrastructure, and amenities.

31. Establishing forest management rules for NZETS forestry participants would also prevent "plant and leave" permanent forestry, which we agree is a source of legitimate and real concern. To be clear, we do not support "plant and leave" permanent forestry and when we discuss continuous cover forestry in this response, we take it as read that this will be understood by officials.

32. We are also cognisant of concerns regarding increased incentives to afforest land that is currently being used for traditional modes of 'productive' land-use e.g. sheep and beef farming. We consider that this concern would be rendered largely irrelevant if proneness to erosion and other suitably specified land-characteristics are used to determine priority areas for this type of forestry.

33. To the extent that concerns regarding perverse incentives for land-use change may remain even despite the above, **we assert that it would be inappropriate for the government to apply additional regulations based on these concerns to land owned by iwi, hapū and Māori landowners.** The historical factors informing present ownership structures and land uses of Māori land are unique to iwi, hapū, and Māori landowners, and from a Te Tiriti o Waitangi perspective, **we reject the idea that the government (both national and local) could legitimately constrain iwi, hapū and Māori landowner rangatiratanga over our whenua in this way.**

34. As an iwi, we bring to bear the full weight of our tikanga and ancestral values when making decisions about our whenua and our people. This allows us to bring an

intergenerational lens to decisions and encourages us to make decisions based on what is best for the whenua and for our whānau. **The ability to do so is central to our exercise of rangatiratanga and is a key reason why we are recommending that optionality in relation to land-use decisions (including forest species selection) should be a key factor in government decision-making on this issue.**

35. We agree that there is good rationale for prioritising erosion-prone lands as sites for continuous cover forests. However, we also wish to be clear that we do not believe that continuous cover forestry (as described in this submission) ought to be limited only to these categories of land. Optionality in relation to land-use decisions means the availability of all possible productive land-uses within the limits prescribed by our tikanga and our responsibility to provide for te oranga o te taiao. Our view is that continuous cover forestry holds great promise as a productive and sustainable land-use in Aotearoa New Zealand and as a key means by which we can realise the transformational vision for the forestry and wood-processing industry outlined in Te Ara Whakahou – Ahumahi Ngahere.6

36. Another important policy consideration regarding aspirations for an indigenous forest solution to building climate resilient landscapes is the impact on rural land prices. Because the indigenous reforestation and permanent protection path has not to date been an economically productive land use, options that restrict species selection without also creating secure long-term funding to make these economically viable investments would crash rural land prices for the landowners. In turn, this would deliver severe economic hardship to rural communities.

37. Our view is that the government's framing of exotic afforestation does not take into account the beneficial option of continuous cover forestry for the permanent category of the NZETS, and the way that this type of forestry encompasses a major potential solution to the permanent, economically productive, reforestation of erosion-prone lands.

38. We are aware that concerns have been raised about the economic viability of forest management-system transitions (e.g., clear-fell to a continuous cover model) funded by at the outset by NZU revenue; the argument being that a forest management-system transition may be viable while the NZU price is high but that it would be vulnerable in the long-term if the NZU price were to fall significantly. We understand these concerns and would suggest that this is primarily a forestry question. Indeed, this is why a continuous cover system for the Permanent Category is so important, i.e., if we want large-scale permanent forests (whether indigenous or exotic), it is imperative that some means for revenue generation (in and out of the ETS) are built-in. This is exactly what

6 Forestry and Wood Processing Industry Transformation Plan | NZ Government (mpi.govt.nz)

continuous cover forest management systems seek to achieve.

39. **It is imperative, therefore, that the government continues to enable restorative reforestation through exotic continuous cover forestry. We recommend that any non-wilding species[7] be allowed under this category and that all registrants be required to adhere to continuous cover forestry management requirements (including for indigenous forests).** We believe doing this will produce the following key outcomes:

    (a) Enable restorative and sustainable forest management for exotic and indigenous forestry

    (b) Remove the option of 'plant and leave' carbon farming

    (c) Enable forestry practices that deliver significant climate resilience and biodiversity ecosystem services as co-benefits.

40. This exotic continuous cover forestry provision should allow for:

    (a) Exotic continuous cover productive forestry in perpetuity (i.e., remaining exotic forest).

    (b) Exotic continuous cover forestry transitioning to indigenous continuous cover productive forestry.

    (c) Exotic continuous cover forestry transitioning to indigenous protection forest (no indigenous harvesting – e.g., on steepest slopes).

    (d) Indigenous continuous cover productive forestry funded by being integrated into a business model that includes exotic continuous cover forestry.

    (e) Indigenous protection forest funded by being integrated into a business model that includes exotic continuous cover forestry.

    (f) Indigenous continuous cover productive or protection forests established with supplemental funding (e.g. government grants).

41. We see Māori having enormous opportunities to engage in the kinds of carbon financed continuous cover forestry listed above, and this having the potential to form a significant element of the Māori economy and a means by which to exercise self-determination in relation to Māori land.

42. As such, **we recommend that the government abandon its plans to ban the use of exotic species in the permanent category of the NZETS, and instead work closely with iwi, hapū, Māori landowners and Māori forestry experts to design and deliver a framework for continuous cover forestry for this NZETS category.**

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7 **Note: We recommend that a threshold definition for 'non-wilding species' be developed in partnership with iwi, hapū, Māori landowners, and Māori forestry experts using the *Guidelines for the use of the Decision Support System "Calculating Wilding Spread Risk From New Plantings"* as a common point of reference**.

43. Lastly, we do also believe that the existing NZETS could be modified to include financial support to stimulate greater uptake of indigenous reforestation. There are several mechanisms that could be put in place to achieve this, and we recommend again this be worked through with iwi, hapū, Māori landowners and Māori forestry experts.

44. On this point, we are especially supportive of investment into research and development for the purpose of supporting incentives for the Māori forestry sector to consider new and/or alternative economically viable opportunities for the sustainable development of our land.

APPENDIX 1 - SUMMARY OF RECOMMENDATIONS ON REMOVALS STRATEGY

45. Focus removals on emissions that are impossible or prohibitively expensive to reduce/abate.

46. Removals that contribute to delivering current and future targets under the Paris Agreement at least cost to the taxpayer and that can therefore be delivered without taxpayer subsidy.

47. Maximising climate resilience and biodiversity co-benefits to enable these co-benefits to be delivered at least cost to the taxpayer.

48. Use the Permanent Forest category of the NZETS to help build climate resilient rural landscapes and recognise permanent forests as 'ecological infrastructure' capable of reducing contingent liability risk associated with extreme weather events. This can then enable government policy to recognise the value of carbon financed permanent forests as a core element of a national climate change adaptation strategy that can be delivered at zero cost to the taxpayer.

49. Focus NZETS permanent forest on lands unsuitable for agriculture unless the farmer wishes to retire agricultural lands for permanent forestry.

50. Define 'permanent forest' as 'managed continuous cover forestry' that includes the following:

    (a) Exotic continuous cover forestry in perpetuity (i.e., remaining exotic forest).

    (b) Exotic continuous cover forestry transitioning to indigenous continuous cover productive forestry.

    (c) Exotic continuous cover forestry transitioning to indigenous protection forest (e.g., on steepest slopes).

    (d) Indigenous continuous cover productive forestry funded by being integrated into a business model that includes exotic continuous cover forestry.

    (e) Indigenous protection forest funded by being integrated into a business model that includes exotic continuous cover forestry.

    (f) Indigenous production or protection forests

51. Allow exotic species in the Permanent Forest category of the NZETS.

52. Require management rules for registrants in the Permanent Forest category (including native forests) to create necessary safeguards to protect against "plant and leave" approaches.

53. When continuous cover harvest management is ground-based, forest establishment should be restricted to slopes capable of supporting such ground-based technologies.

54. On slopes too steep for ground-based harvesting technologies, require:

(a) The use of aerial technologies for harvesting and hauling (e.g., cable, helicopter, or drone); or

(b) No harvest forest management (e.g., permanent, non-productive indigenous forest; poisoning exotic trees when opening canopy gaps for transition to indigenous species).

APPENDIX 2 – TECHNICAL BACKGROUND: MARGINAL COST OF ABATEMENT

55. The logic underlying effective carbon markets is the marginal cost of abatement (emission reductions or removals). Additional abatement actions tend to increase in cost over time because the cheaper and more immediately accessible abatement actions are generally pursued first. As these actions are completed (harvesting the low-hanging fruit), the possible further abatement actions remaining to the actor are the more expensive and less readily available ones (the high-hanging fruit). On this basis, the marginal cost of abatement increases (e.g., per 1tCO2e) as one moves from low fruit, to medium, and then high fruit on the "tree" of abatement. The challenge for government policy and the design of the NZETS is how to cause gross abatement for emissions up to a particular level of carbon price.

56. The two main lenses with which to view the marginal abatement curve are the cost-efficiency lens, and the carbon price and offsetting lens.

(a) **Cost Efficiency:** Given that the economy and organisations within it have low and medium fruit and given that there are not unlimited funds available for emissions reduction, an efficient emissions reduction strategy (and policy) would pursue these low and then medium fruit first.

(b) **Carbon Price & Offsetting:** When carbon offsets are available in a carbon financing instrument there is always an option to choose between:

(i) Abate in-house (gross abatement).

(ii) Abate via offsetting (offsetting with no gross abatement).

(iii) Abate in-house and offsetting (net abatement).

57. The carbon price (e.g., the cost of carbon credits) and the design of the financing instrument can have an influence on the choice between a), b), or c) above. The NZETS is designed around option b) above.

58. The NZETS was designed as a 'net carbon' market mechanism, without any specific gross emission reduction targets for NZETS participant emitters, and removals via offsetting designed to be the norm rather than the exception. For this reason, an effective

relationship between the marginal cost of gross abatement, carbon pricing and removals via offsetting has never been realised in the NZETS.

59. One fundamental problem we feel has not been adequately grappled with is the fact that emissions pricing can only produce behaviour-change in relation to the use of fossil fuel-based energy to the extent that different groups in society are exposed and responsive to carbon price signals. Fossil fuel use in some sectors has proven not to be very responsive to price signals – i.e. these sectors are 'price inelastic'. This means that when the price of fossil energy rises, individuals and firms in the short term have limited options to respond and mostly tend to just pay the higher price rather than reduce demand or transition to alternatives. In this situation, the cost of energy rises (raising the cost of living to households/consumers) but this does not translate into emissions reduction behaviour change upstream in the energy system (e.g., energy and transport service suppliers).

60. For this reason, **we recommend a much greater focus in ETS settings on those groups in society that have the most agency to influence and undertake desired behaviour changes, and which are likely to be more responsive to the carbon price signal if they are exposed to and have the ability to respond to it.**

61. For example, investors motivated by economic self-interest in returns on their investment can move their money from dirty technology to clean technology in response to a carbon price that lowers the profitability of dirty development/technology. However, this only works if the carbon price impacts on the profitability of the underlying investment in an NZETS participant. This profitability is, in turn, influenced by whether the company can pass on this cost to their customers without being exposed to the risk that these customers will stop using their product in favour of another product that is reasonably accessible to them.

62. The ETS and the Carbon Price Signal can play an important role in driving this process, however, the ETS is only one tool and other complementary measures are needed. Other tools could include measures such as:

    (a) Imposing participant-specific caps on gross emissions for demand side participants in the NZETS

    (b) Targeted policies and regulation.

    (c) Financial incentives for clean energy and technology (to make it more competitive with dirty energy and technology).

    (d) Government providing risk mitigation for private investment (e.g., functioning as a keystone investor, providing capital at a low cost of capital, underwriting investment risk).

    (e) Stimulating a strong voluntary carbon market (VCM) and including energy and

agriculture in this market.

63. A focus on situating the ETS within an ecosystem of policy instruments designed to maximise the impact of the carbon price signal would also minimize the need to rely on popular political support from individual consumers and interest groups, and thus decrease the likelihood that climate change policy will become subject to unhelpful political partisanship.

APPENDIX 3 – TECHNICAL BACKGROUND: REMOVAL INCENTIVES

64. As mentioned above, we believe that government climate change policy should be more informed by Marginal Abatement Cost Curves (**MACCs**), with a particular focus on achieving an effective relationship between the marginal cost of gross abatement, carbon pricing, and removals via offsetting.

65. In our view, retaining strong incentives for removal activities is of fundamental importance to achieving an effective relationship in this regard. For example, if the approach is to target emission reductions for abatement below the carbon price and use offsetting to target those emissions that are either impossible or prohibitively expensive to abate, removals will remain a fundamental component of the overall system. Our view is that this strategy provides a strong rationale for the offsetting of trade exposed carbon intensive industries, and a proportion of emissions from other industries that are prohibitively expensive to abate in-house.

66. It should also be noted that achieving a zero-carbon (or carbon negative) outcome without offsetting (for the nation and also for most organisations) is impossible. There are many emission types that are either physically impossible to eliminate/reduce or prohibitively expensive to deliver. Furthermore, because humans are not plants, we are obligatory emitters of CO2 anyway. We also note here that fossil fuel emissions are not the only GHG emissions to consider. As long as we plan to eat food from agriculture, we will have agricultural emissions whether from soils, fertilizers, or ruminant animals.

67. Removal activities will also provide important benefits in the form of reducing the volume of abatement to be purchased offshore. If the taxpayer is being asked to buy emissions units from offshore for current and future international commitments, we believe that this money would be better spent causing additional abatement and removals domestically. For example, the nation needs to reforest around 1 million hectares of erosion-prone pasture and marginal land into permanent forest for climate resilience. If these removals can be delivered through the NZETS, then:

    (a) The cost burden for this mitigation will be borne by the private sector rather than the taxpayer, and

    (b) The nation will have a major component of the national climate change adaptation agenda funded by the private sector at no cost to the taxpayer.

68. **In summary, our view is that the key is to bring the economy (and the global**

community) into balance between emissions from GHG sources and removals by GHG sinks.

69. Nevertheless, we are also cognisant that one component of supporting an ETS that is able to contribute to achieving such a balance is consideration of the volume of NZUs made available to the market through removal activities (i.e. forestry), and what effect this volume could have on the carbon price signal and level of gross emission reductions over time.

70. The discussion document outlines concerns in this regard relating to a potential future oversupply of NZUs to the market, and a subsequent crash in the carbon price signal due to projected afforestation rates in response to a high carbon price signal in the short-term.

71. On our reading, evidence provided to elucidate the rationale for these concerns is largely based on the Afforestation and Deforestation Intentions Survey Report conducted in 2021 for MPI (**Intentions Survey**).8 This Intentions Survey is cited as a key resource informing the modelling assumptions in the Forestry and Allocation and Surrender Forecasts Paper compiled for MPI in 2023.9 We also understand that the modelling included in Chapter 2 of the ETS Review discussion documents (Figures 3, 4, and 5) also utilise assumptions arising out of the Intentions Survey.

72. Without going into detail and repeating criticisms that will no doubt appear in other submissions; our networks inform us that the government's use of the Intentions Survey to inform modelling for projected planting rates and NZU prices is highly contested.

73. We agree that the volume of NZUs made available to the market through removal activities is a lever in the system that can be adjusted to amplify the impact of the carbon price signal and drive more reductions in gross emissions. However, our view is that there is currently an unacceptable level of uncertainty surrounding the projections and modelling the government is relying on to identify and scope the problem which the ETS Review is setting out to remedy. This is further complicated by the fact that it is not at all clear that we have a good understanding of what future demand dynamics for carbon removals might look like if, for example, agriculture is included in the ETS, and/or opportunities become available for the export of carbon removal units. We also note that net-zero by 2050 is a short-to-medium-term goal and that a long-term goal would be to achieve a net-negative emissions profile.

74. Overall, we are not satisfied that the government has a clear, principled, and cohesive vision informing its attempts to address this issue. This has led to a situation in which

8 Afforestation and Deforestation Intentions Survey 2021 (mpi.govt.nz)
9 New Zealand's Emissions Trading Scheme Forestry Allocation and Surrender Forecasts – March 2023 Baseline Budget Update (mpi.govt.nz)

removals from forestry have come to be seen as a divisive political problem rather than a sensible and important climate change solution.

75. We believe that this issue is able to be addressed in a constructive manner that upholds the key principles and priorities we have outlined in this document, including the fundamental principle of compliance with Te Tiriti o Waitangi. However, this will require the Crown to co-design solutions with iwi, hapū and Māori landowners, as well as Māori forestry and agriculture experts.

EMISSIONS TRADING SCHEME

TE RŪNANGA O NGĀTI RĀRUA

SUBMISSION TO MINISTRY FOR THE ENVIRONMENT

SUBMITTER INFORMATION

Name: Te Rūnanga o Ngāti Rārua

Iwi / hapū: Ngāti Rārua

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Email: [redacted]

Phone: [redacted]

Contact: Shane Graham Pouwhakahaere / CEO

EMISSIONS TRADING SCHEME

TE RŪNANGA O NGĀTI RĀRUA

SUBMISSION TO MINISTRY FOR THE ENVIRONMENT

Ranea te rangi e tū nei

Ranea te papa e takoto nei

Ranea te pouherenga tangata o motu,

Kei ngā mate tautini, taumano

Haere, whakangaro atu rā

Ki a tātou te hunga ora

Whakamana te puna mauri ora o Ngāti Rārua,
kia kaha pupuri ai ngā hekenga ā mauri muri ake tonu.

Realise the wellspring of vital identity that is Ngāti Rārua,
to strengthen all the migrations yet to come

1. Ngāti Rārua descend from the Tainui waka and originate from the western coast of the King Country, Waikato. Our origins are traced back by whakapapa to the eponymous ancestor Rāruaioio. Ngāti Rārua tūpuna came to Te Tauihu o te Waka a Māui in the 1820s and 1830s, as part of the great southward migration of the Kawhia and Taranaki iwi. Ngāti Rārua were participants in the series of war parties or tauā that came to Te Tauihu o to Waka a Maui (Te Tauihu), which were followed by heke of occupation, whereby Ngāti Rārua were established as mana whenua down the West Coast and across the top of Te Waipounamu.

2. By 1840, Ngāti Rārua were resident in the Cloudy Bay and Wairau districts in eastern Te Tauihu. In western Te Tauihu, Ngāti Rārua maintained seasonal and permanent kāinga

at Whakatū, Motueka, Moutere, Aorere and West Whanganui/Taitapu.

3. Ngāti Rārua marae today are: Te Āwhina Marae (Tūrangāpeke), Motueka; Wairau Pa (Wairau), Blenheim; Hauhunga Marae (Parerārua), Blenheim; Whakatū Marae (Kākāti), Nelson; and Onetahua marae (Te Ao Mārama), Takaka.

4. The Ngāti Rārua Iwi Trust was established in 1992 and in 1996 the historical Treaty claim WAI 594 was lodged with the Waitangi Tribunal. The claim settlement was signed and celebrated at Hauhunga in 2013. Te Rūnanga o Ngāti Rārua was established as the overarching identity for the Ngāti Rārua Iwi Trust, Ngāti Rārua Settlement Trust and all other Ngāti Rārua iwi entities.

5. Te Rūnanga o Ngāti Rārua is active today working for the wellbeing, prosperity, and sustainability of our whānau, hapū, iwi and rohe. Te Rūnanga o Ngāti Rārua manages an extensive portfolio of assets including aquaculture, horticulture and forestry enterprises.

6. Te Rūnanga o Ngāti Rārua is committed to working collaboratively with the other seven iwi of Te Tauihu, and in partnership with the Crown, the region's local authorities, and research entities, on collective kaupapa Māori initiatives for the benefit of our whānau, hapū and communities and for our natural environment and taonga tuku iho.

INTRODUCTION

7. This submission is made by Te Rūnanga o Ngāti Rārua in response to the Ministry for the Environment's Discussion Documents, *Te Arotake Mahere Hokohoko Tukunga Review of the NZ Emissions Trading Scheme*, and *A Redesigned NZ ETS Permanent Forest Category* (**the Discussion Documents**) released for public consultation on 19 June 2023 (**the review**). Te Rūnanga o Ngāti Rārua acknowledges the analysis and submission template completed by National Iwi Chairs Forum (**NICF**) technicians on the Discussion Documents and the issues raised by this review.

PRINCIPLES – TE TIRITI O WAITANGI

8. Te Rūnanga o Ngāti Rārua supports in principle the submission made by the NICF, and the values and principles upheld in that submission.

9. In particular, Te Rūnanga o Ngāti Rārua endorses the fundamental importance, in any review or refocusing of the ETS and any other Government initiatives designed to address

the challenges of climate change, of the following principles:

9.1. *Te Tiriti o Waitangi:* Te Rūnanga o Ngāti Rārua expects the Crown to engage meaningfully with iwi and hapū as its Tiriti partners in all policies and programmes responding to climate change. This includes appropriate measures to fulfil the Crown's obligations under the Tiriti principle of Active Protection of iwi and hapū rights and interests including rangatiratanga, mana, mauri, kawa, tikanga, mātauranga Māori, kaitiakitanga, and manaakitanga. The statutory obligations of central government agencies and regional, territorial and local authorities, notably the requirements of the new Natural and Built Environments legislation (**NBE**)[1] to give effect to the principles of Te Tiriti, will be central to achieving these obligations. This requires effective, ongoing, adequately resourced engagement with iwi and hapū in relation to the particular needs, priorities and opportunities within our rohe – for Ngāti Rārua, the extensive landscapes, ecosystems and communities of Te Tauihu.

9.2. Te Oranga o te Taiao and Te Mana o te Wai: Te Rūnanga o Ngāti Rārua expects that the eventual outcomes of the current ETS review will be purposefully and comprehensively consistent with the requirements of the new NBE and the National Policy Statement for Freshwater Management.[2] These statutory obligations give a clear focus on the integrity, mana and mauri, and intrinsic values of the whenua, natural environment and taonga that are central to the heritage, identity and wellbeing of iwi and hapū as tangata whenua and kaitiaki.

9.3. Climate Change Response: Te Rūnanga o Ngāti Rārua supports the points raised by the NICF that any policies and programmes responding to climate change must be affordable and effective, that it preserves and protects the relationship of iwi, hapū and Māori landowners to our whenua, and enables iwi and hapū to build our own resilience through economic prosperity and sustainable land management. Te Rūnanga o Ngāti Rārua is currently developing our own Climate Change Strategy which will future proof our cultural, social, environmental and economic interests through the coming challenges and strengthen our mātauranga and resilience as an iwi. Te Rūnanga o Ngāti Rārua expects the Crown to recognise our iwi climate initiatives and those of other iwi, and to ensure that Government policy and

[1] https://www.legislation.govt.nz/bill/government/2022/0186/19.0/LMS773766.html

[2] https://environment.govt.nz/publications/national-policy-statement-for-freshwater-management-2020-amended-february-2023/

programmes such as the ETS and the review enable our rangatiratanga to develop and implement this important mahi.

9.4. *Climate Resilient Landscapes:* Te Rūnanga o Ngāti Rārua supports the principle advanced by the NICF that Aotearoa New Zealand needs to build climate resilient landscapes, especially in erosion prone areas including some parts of Te Tauihu. We consider that any review of the ETS needs to prioritise options to proactively restore and enhance the mana, mauri and ecological health of our whenua, waterways and natural taonga. These principles are clearly stated in *Poipoia Te Ao Tūroa*, the 2021 Ngāti Rārua Environmental Strategy, which includes Objectives and Policies for Mauri – Protecting the life-supporting capacity of the natural world – and for Wai, Mahinga Kai, Mātauranga, and Whenua.[3] The importance of climate and environmental resilience is also central to the overarching Vision and cultural, social and economic objectives set out in *Kia Pai Te Noho*, the Ngāti Rārua Strategic Plan 2020-2040.[4] Te Rūnanga o Ngāti Rārua expects any Crown policy and programmes such as the ETS and the current review to create systems and structures that will facilitate our ability to work towards and achieve these goals, rather than policy and systems that would constrain our options or impose unnecessary barriers to Ngāti Rārua advancement.

9.5. *Diversity of options:* Te Rūnanga o Ngāti Rārua expects the review of the ETS to recognise and enable a diverse range of options to address climate change, emissions reduction, and other environmental management challenges. Clearly there will be multiple ways in which Aotearoa NZ, iwi, hapū, agencies and communities will be able to harness mātauranga, Western science, technological innovation and creativity to respond in new ways and build new means of resilience, prosperity and wellbeing. The NICF submission offers a discussion of the opportunities with continuous cover exotic forestry, as a method relevant for the permanent category of the ETS. However, Te Rūnanga o Ngāti Rārua considers that the necessary restoration and enhancement of our whenua, wai and natural taonga must include both indigenous and exotic ecosystems. Each rohe or local area will have its own unique spectrum of immediate and longer-term ecological needs, biological communities, soil types and water resources. Each iwi and hapū have their own mana and rangatiratanga underpinning their particular priorities and aspirations for their

[3] https://www.ngatirarua.iwi.nz/poipoia-te-ao-turoa/

[4] https://www.ngatirarua.iwi.nz/our-vision/?ref=ngatirarua.iwi.nz

whenua and its future. Climate resilience for Aotearoa NZ will not be achieved by a blanket, one-size-fits-all approach but by flexibility and regional and local relevance. This will only be possible through ongoing, meaningful participation of iwi and hapū in strategy and policy decision making, implementation and monitoring programmes for climate action for their rohe.

Recommendation:

Te Rūnanga o Ngāti Rārua recommends that the review of the Emissions Trading Scheme and Permanent Forest Category are clearly focused on the key principles outlined in this submission:

- ***Te Tiriti o Waitangi;***
- ***Te Oranga o te Taiao and Te Mana o te Wai;***
- ***Affordable and effective climate change response policy and programmes that preserve and protect the relationship of iwi and hapū and Māori landowners with our whenua and natural taonga, and enables iwi and hapū to build our own resilience through economic prosperity and sustainable land management;***
- ***Proactive restoration and enhancement of the mana, mauri and ecological health of our whenua, waterways and natural taonga, to build climate resilient landscapes; and***
- ***Flexibility to provide a diversity of options to meet the unique regional and local needs and priorities of iwi and hapū and the landscapes and ecosystems in each rohe.***

CONCLUSION

10. Te Rūnanga o Ngāti Rārua thanks the Ministry for the opportunity to make this submission and we look forward to further engagement as the review of the ETS progresses.

Submission on the Review of the New Zealand Emissions Trading Scheme

25th August 2023

Submission summary for Ministers

To ensure the Climate Forestry Association's position is captured accurately, we have prepared this one paragraph summary for Ministers. This summary paragraph should be copied directly into the briefing document provided to Ministers.[1]

The Climate Forestry Association disagrees that there is a problem to be solved. The Emissions Trading Scheme (ETS) is working, working well, and working as intended. There is no crisis, as the risk of forestry is oversupply of credits is significantly overstated due to misused modelling. Gross emissions are dropping thanks to complementary behaviour of emitters, who use offsets to support public and trade-based expectations of them while they undertake emissions reductions. Emissions are also dropping due to complementary policy initiatives, that are effectively funded by ETS revenues. All the options listed do not improve on the performance of the ETS in any manner. All the options risk incredible, unmodelled costs on New Zealanders, particularly those of lower incomes, and therefore undermine the Government's commitment to a just transition. This process has undermined confidence of both foresters and investors to such a degree that planting intentions have collapsed, which will make our commitments – in both law and international treaty – harder to obtain and will make us more reliant, and hypocritical, on purchasing forestry-based offsets from offshore, at further incredible expense. We submit that this process must stop immediately, as the case for change has not been made, and this poor process has caused too much damage already.

[1] We understand that officials have committed to other parties that a paragraph summary statement of this nature will be copied verbatim into Ministerial briefing documents. We wish to ensure that this CFA submission is treated in the same manner.

Summary of our submission

1. This document is the Climate Forestry Association (**CFA**) submission to the Ministry for the Environment (**MfE**) on the "Review of the New Zealand Emissions Trading Scheme" (**the Review**) Discussion Document.

2. We submit that this process should immediately cease, as we find much to disagree with in this Discussion Document, including:

    a. We disagree that there is a problem to be solved. We believe the Emissions Trading Scheme (**ETS**) is working as designed and intended. Further, we believe that is the only part of New Zealand's approach to managing the harmful effects of climate gasses that is currently working and contributing to our commitments in both law and international treaty.

    b. We disagree with the core premise of this Review: that there is a future problem of credit supply, which risks crashing the price of New Zealand Units (NZUs) and disincentivising gross emission reductions, and that that justifies a review of this nature now. The modelling and assumptions on future credit supply that underpin this Review have been discredited before. In addition, this model is inaccurate and misleading because it does not consider the immediate collapse in planting intentions that has occurred simply due to this Review process.

    c. We disagree that New Zealand needs to prioritise gross emissions over net emissions. This never has been and never will be a binary choice, and never has been the design principle for the New Zealand ETS. All our climate targets, obligations and future expenses are based on our net emission position. Plus, there is evidence that the current ETS settings are working, with gross emissions falling thanks to complementary policy initiatives.

    d. We disagree with all of the options presented, as they are all unworkable, unaffordable and ineffective. All the options presented in this Review will undermine the effectiveness of New Zealand's ETS. They will do this by damaging the incentives to plant the forests New Zealand needs to meet our commitments. They will also do this by imposing uncalculated,

but undoubtedly extreme, costs upon households and the economy. This runs counter to the government's commitment that any transition to a low carbon economy will be done fairly.

e. Even if we were to agree with this problem definition – and we do not - we disagree with the concept of significant change to the ETS. There are plenty of settings inside the current ETS that can be used to achieve these outcomes, if indeed they were required.

f. We disagree with the process that officials have used to consider these matters. In fact, we contend instead that this Review process should be considered a professional embarrassment to any credible public official, with different information provided to different stakeholders, incomplete data and falsified statements about data availability, and non-existent, inadequate and amateurish modelling in all substantive areas.

3. All the options presented in this Discussion Document will make New Zealand's climate targets harder to achieve. All the options will cost taxpayers billions, and result in us paying billions more for forestry-based offsetting credits from offshore. All the options will undermine New Zealander's costs of living and employability and run counter to the government's commitment to pursue a just transition to a low carbon economy.

4. We submit that the ETS works as designed and intended, and that this Review process has failed to make an adequate case for change to it.

5. Given the damage that this Review process has already done to forestry in New Zealand, and accordingly to our ability to make use of forestry offsets, we further submit that this Review process should immediately cease.

Who we are

6. The CFA represents foresters, ecologists, Māori and non-Māori landowners, community organisations, consultants, and investors. We support responsible landowners who are committed to tackling the climate crisis with urgency, creating jobs and incomes for

communities across Aotearoa and ultimately restoring native forests to recloak the whenua. The CFA promotes the active management of permanent forestry, including continuous canopy harvest forestry, native-only forestry, and transitioning exotic to native forestry.

7. Climate forestry is the term we use to refer to forestry that helps New Zealand meet our climate crisis – through sequestration of carbon in forests, and through helping build more climate resilience into our landscapes, communities and economy. Our members undertake climate forestry, meaning they manage their forests in the long term as a means of carbon sequestration but also to optimise land use by using fit for purpose land, preserving and improving biodiversity, and reducing predators.

8. New Zealand, and the world, is facing a climate emergency and action is required now to mitigate the impacts of our changing climate. CFA members and the climate forestry community are deeply motivated to do our part to meet this challenge, by make a meaningful contribution to the sequestration of harmful greenhouse gasses, while also restoring the whenua of Aotearoa to native, biodiverse forests.

Our submission

This is the latest in a long line of reviews and reconsiderations.

9. In the 21 years since it was enacted, the Climate Change Response Act 2002 has been amended more than 30 times, and there have been four major reviews of the ETS.

10. Each of these previous reviews and amendments have intended to improve the function of the ETS. It has been considered, reconsidered, and reviewed extensively. We are confused as to why yet another major review is now required to yet again attempt to improve the function of the ETS.

11. Twenty-one years is a short period of time in forestry terms. Forestry is a long-term investment and requires regulatory certainty and consistency – not constant and counterproductive tinkering with the rules.

12. The options presented in the Discussion Document appear to be aimed at increasing Government control over the ETS and disincentivising private investment (which to date has been at the heart of the success of forestry in the ETS), while simultaneously and openly removing opportunities and existing asset value from forest owners at significant cost to forest owners, communities, and taxpayers.

13. Instead of providing regulatory certainty and consistency, this particular Review has dealt a considerable blow to confidence in the forestry community. In of itself, this Discussion Document has led to the price of NZUs falling from approximately $80 at the end of 2022, to as low as approximately $30 at the lowest point this year. This is an ironic impact for a Review process that intends to provide long term price stability in NZUs.

14. Another consequence of this poorly considered and designed Review process is the near complete cessation of planting intentions for the next year. Forest industry leaders have been universal in their condemnation of the proposals and have put a freeze on new forest investments and planting until this consultation is concluded as the proposals strongly disincentivise any further investment.

15. The CFA understands from our membership that planting of new forests to register in the ETS will fall below 10,000 HA next year. This

will have a flow on effect to the viability of seedling providers, to workforce requirements to manage planting and to the returns to landowners. It will also be out of line with any projections or estimates MfE are using as a justification for this Review.

16. These reactions to this consultation are not inconsequential. They undermine the confidence of both participants and investors in the forestry market – parties that have entered the market in the first place to "do the right thing" and support the achievement of our climate goals, while at the same time making a commercially viable return on their investments and efforts. That chilling effect, in addition to ongoing regulatory tinkering, is highly damaging to the forestry sector.

17. These consequences will take time to unwind. A lack of planting risks pushing some seedling suppliers out of business. As we have seen previously in the New Zealand forestry marketplace, this sort of capacity change will take as much as 3-5 years to recover from. As a result, any forward-looking modelling of forestry credit supply – such as that that this consultation is based upon – will be even more inaccurate due to the harm caused to our sector.

The Discussion Document fails to make any valid case for changing the ETS.

18. This is not to say that Government cannot or should not consider whether the ETS is fit for purpose – though it is to say that surely after this many reviews, New Zealand should be more confident about the answer to that.

19. What we are saying is that this particular Review fails to make a case for further change to New Zealand's ETS – particularly given how damaging it has already been.

20. The Discussion Document claims change is needed because there will be too many trees in the future and too many NZUs. The Discussion Document suggests that the ETS is a failure and is in desperate need of reform, if anything to save and preserve the investments of our members.

21. While we appreciate the concern, we are not convinced. The models the Government are using to justify this Review are based on

outdated assumptions, then extrapolated in a manner that simply bears no relationship with reality.

22. We disagree with the purpose of this Review because at the heart of it, the facts just don't back up what is stated in the Discussion Document. We say that on the basis of the following facts.

Fact #1: Forestry carbon sequestration works and is the best solution.

23. The first fact is forestry carbon sequestration works and is the most readily available solution for meeting our commitments and curb the worst of climate change. Over the next 30 years when our actions in the climate crisis are absolutely critical, why would we shy away from using trees to help with our carbon targets?

24. We have net carbon commitments because it is what every country in the world has signed up for. We use forestry as part of our solution in New Zealand because it is what we are very good at – extensive expertise and experience, alongside world-class research and evidence, and enabled by extensive land that has few better uses.

25. Right now, New Zealand's forests are already offsetting all the emissions from cars in New Zealand. Our forests provide jobs for kiwis, provide investment and opportunity in the regions, and provide funds for new initiatives like low carbon investment.

26. New Zealand is in the enviable position where we can use forestry to manage the transition to lower gross emissions in a manner that provides time to manage gross emission reductions fairly.

Fact #2: We can encourage both net and gross emissions reductions – they are not mutually exclusive.

27. This leads to the second inconvenient truth, that the ETS has been designed to encourage both net and gross emissions. Yes, Ministers have said that the ETS isn't enough on its own. But no one has ever claimed that it is or should be, and no one credibly suggests that it is all we are doing. Its disingenuous to move the goalposts to gross emissions only, then claim the ETS can't do it – it was never designed to.

28. If we consider the real world, as opposed to modelled or expected outcomes, there is increasing evidence that emitters will undertake both net and gross emission reductions. Research by Sylvera on companies in the United States of America shows that offsetting carbon emissions is undertaken by those entities that are simultaneously reducing their gross emissions:

> *"...on average, companies that buy carbon credits are simultaneously cutting their Scope 1 and 2 emissions by 6.2% per year. Meanwhile, companies that don't use carbon credits are cutting emissions by only 3.4% per year."*

And

> ***"Yet even without data on quality, this study demonstrates that investment in carbon credits doesn't stop companies from taking meaningful climate action.*** *We always recommend following the mitigation hierarchy: prioritizing reducing emissions and then sourcing the highest quality credits.*
>
> *Businesses combining these actions will help unlock the speed and scale needed to make meaningful climate progress to meet the Paris Agreement targets. As UN Secretary General António Guterres stated with the publication of the latest IPCC synthesis report, "Our world needs climate action on all fronts - everything, everywhere, all at once." Companies need to leverage every tool available to collectively combat the climate crisis and secure a safe future for the planet and its inhabitants."*

29. We expect that similar outcomes would be observed in New Zealand. That's because that while New Zealand emitters have credible commitments to reduce their emissions, these things take time to do so in a sensible, affordable, and effective manner. They're cutting their gross emissions and offsetting in the meantime because, in large part, it is what Kiwis, and our trading partners expect of them.

30. It's disingenuous to suggest that these gross emission reductions aren't in train or acknowledge the evidence as to what the barriers to faster action are – consenting, capital availability and technology.

31. What is not stated as a barrier is the ETS and forestry. That's because what forestry and the ETS is doing is buying us the time we need to do this in a manner that is fair for everyone.

Fact #3: Forestry has extensive additional benefits that are not considered in this process.

32. When carefully managed, our exotic forests are capable of transitioning to native forests. The knowledge and expertise to do this has been developed, proven, and refined right here in Aotearoa over more than four decades.

33. Repeated consultations roll out tired and unfounded claims of adverse impacts of exotic forests. The Discussion Document contains a misleading section on the "impacts of exotic afforestation", which a on a careful read all relate to "unmanaged" forests.

34. The CFA promotes the active management of permanent forestry, including continuous canopy harvest forestry, native-only forestry, and transitioning exotic to native forestry.

35. Any land use can cause adverse outcomes if not well managed. For example, a badly managed farm might pollute nearby waterways, but that does not mean we should restrict farming – instead we should require good management practices. It is the quality of management that counts, not the underlying type of land use. Well managed forests:

    a. Produce more jobs than many other land uses and as such have positive flow-on effects for rural communities;

    b. Have the opportunity to generate an export market for NZUs as international linkages develop over time in line with Article 6 of the Paris Agreement;

    c. Produce positive environmental outcomes such as erosion reduction, improving soil conservation, flood reduction, water quality and enhancing of biodiversity and potential adverse outcomes such as fire, disease and wilding pines are minimised or eliminated through good management practices;

    d. Are a productive land use which support Aotearoa's efforts to achieve our climate goals.

36. Transition-to-native forestry is the only affordable means of establishing long and slow growth native forestry at scale. With active management, it utilises the reliable, fast-growing properties of exotics to provide the right environment for more fragile native trees to flourish.

37. Our forests also rapidly sequester carbon. This is urgently needed for New Zealand to do its bit and meet its international climate commitments and provides a pathway for our transition to lower gross emissions over time.

38. All of this is being done without investment from the taxpayer or the requirement of government funding.

39. The UN Climate Tracker assesses New Zealand's overall climate action responses as "highly insufficient".[2] The only area where the UN judges New Zealand's climate action as sufficient is "land use & forestry". The CFA finds it extremely frustrating that the Discussion Document contains proposals which would seriously undermine the one area of climate action where New Zealand is succeeding.

40. We all know there is no time to be wasted in curbing the worst of climate change. We need to put everything we can into taking this action – and right now, there's no more affordable and effective manner than using our forests.

41. In other words, our forests provide a win for everyone – a win for nature, a win for native forests, a win for landowners, a win for the taxpayer and most importantly, a win for our climate.

Fact #4: There is no crisis with the ETS - Government "modelling" does not support the proposed options.

42. The Discussion Document claims that the Government must act to save the market from crashing at some unspecified point in the next decade, based on dodgy data about future forestry supply.

43. Yet the biggest threat to market supply and pricing is this poorly designed consultation process, which halved the value of forestry credits following the publication of the Discussion Document, before the announcement of a reduction auction volumes (i.e. the ETS working as intended) provided some limited and tentative recovery in NZU value, with the market still nervously watching the outcome of this consultation process. It's also inconvenient to acknowledge the statements from the Minister refusing to rule out retrospective

[2] https://climateactiontracker.org/countries/new-zealand/#:~:text=We%20rate%20New%20Zealand's%20NDC,warming%20to%201.5%C2%B0C.

application of these options, which has ripped the bottom out of the market.

44. We could not be more concerned about the evidentiary base behind these future credit supply assumptions. Throughout this process, we have asked MfE to share with us the basis upon which these assumptions have been made. Firstly, we were told that the data would be summarised and supplied; then we were provided it later than indicated, and with most of the useable information removed. Then, as late as the 17th of August – post the formal closing date for submissions on this Review process – we are provided with some of the underlying assumptions behind that model.

45. We must also challenge again MfE's repeated assertion that this modelling does not drive this process. This credit supply modelling – despite its flaws – is central to the argument about the risk of oversupply in the 2030s, which is the essence of what this Review process is intended to solve for.

46. If we accept that statement – that modelling does not drive this process – then we are left with two equally unattractive prospects. We would welcome clarity from MfE about which of these is the case:

    a. Either, MfE does not have evidence to back up the purpose of this Review. Given that we understand this Review serves as the Regulatory Impact Statement (RIS) for this process, that cannot meet the evidentiary bar for such an impactful set of changes. In which case, MfE has failed to meet its statutory requirements in undertaking this Review.

    b. Or, MfE has misled Ministers, market participants and the public in hiding or obfuscating this modelling so that it cannot be tested and understood – presumably because MfE itself knows that it would not withstand such scrutiny. In this case, MfE is conducting itself in a highly questionable and challengeable manner.

47. Despite MfE's reluctance to share this data, what we know about the MfE modelling is it is based on the "Manley" model – a construct that the author himself has made clear cannot and should not be used as a forward-looking basis for policy decisions on future credit supply.

48. In the short time available since receiving the Government's modelling, ourselves, our members, and many others in the industry have reviewed it and we have concluded that:

    a. Forecast demand for NZUs is understated (some sources of demand are not considered);

    b. Forecast afforestation is overstated (even before the Discussion Document caused a halt in new forest planting activity);

    c. Forecast NZU supply from forests is overstated as a result of the above overstating of supply and understating of demand; and

    d. It is therefore very uncertain that NZU supply would exceed NZU demand.

49. Given that the Government's proposals are built on what are proving to be very shaking foundations, we repeat our plea that this consultation be withdrawn immediately.

Fact #5: We cannot afford these proposals, as they will impose massive costs on all New Zealanders.

50. All of the options contemplated in this Review will impose significant costs on the New Zealand economy. The Discussion Document briefly lists some of these chilling real-world impacts – job losses, firm relocations offshore, and higher household bills for fuel and electricity.

51. During this consultation, we have therefore sought through the Official Information Act (OIA) more information about these effects and costs, and the modelling that MfE has done on them. We did so on the basis that surely a document that forms part of the RIS process would have put some effort in to understanding these impacts.

52. We were astounded to receive the answer to these OIA requests, that no such modelling exists.

53. Since MfE then doesn't know, we've done our own modelling of these impacts. The most "affordable" option in this consultation could cost the economy $19 billion. That's over $12,000 per household.

54. There will be more cost to come. If the direction of this Review continues, we will deliberately limit the amount of forestry credits that are used to "net-off" our emissions. Yet our net-emission based commitments – in both law and in international treaty – will still hold.

55. If this Review process continues and any of, or any combination of, the options in the Discussion Document are enabled, the impact on forestry will mean we would have crippled our own ability to meet these net-emission commitments. This will leave an even larger shortfall in our Nationally Determined Contribution. Already Treasury estimates that this shortfall could cost New Zealand up to $24 billion in offshore credit purchases. Thanks to this process, we risk making that number larger still.

56. We cannot put our feedback in this regard strongly enough. This is lunacy. This Review, if furthered and enacted, will cost New Zealanders billions on top of billions. In a global sense, it will not reduce the amount of forestry – instead, it will offshore that responsibility for our emissions, by paying someone else to plant forests for New Zealand.

57. That's NIMBYing our climate response to being someone else's problem. The proposals threaten to cripple our own forestry industry, while at the same time proposing to write astonishingly large cheques to feed the forestry industry of other countries.

After all these reviews, surely the Government realises that the ETS can meet these "problems" without further change.

58. To be clear, we disagree that any credible case for change has been made in this Review process. Nevertheless, we wish to highlight that even if MfE is determined to persist with this foolhardy endeavour, that it would consider whether the ETS as currently designed is capable of meeting the policy problem definition.

59. In this instance, this Review is missing an "Option Zero" – utilising the settings within the ETS to manage the risks this Discussion Document details.

60. After all, and surely as MfE realises, the ETS already includes both price and volume control mechanisms. The ETS already includes a pathway for both price and volume over time to provide growing

incentive to reduce gross emissions. And the ETS already includes all sectors of New Zealand's emissions profile, aside from agriculture, and has widespread acceptance across the economy.

61. However, the best evidence of the effectiveness of the ETS is in how our gross emissions are dropping. As StatsNZ has reported, New Zealand's emissions have fallen nine percent over the last three years of year-on-year decreases. The revenue from the ETS is supporting Government interventions to target further gross emissions cuts – a great example of how the ETS supports complementary policy measures to reduce our gross emissions even further.

62. In other words, the ETS is working, and is working exactly as designed and intended. These settings mean it can continue to work even if the problems listed in this Review are true.

63. We repeat the primary point of this submission – that this Review process must cease. However, if it is to continue, we further submit that all of the options listed need to be compared against this "Option Zero", of utilising the settings within the ETS to address any issues of supply and pricing.

Respect the rule of law and property rights – preserve current investments.

64. The Discussion Document shows a frighteningly cavalier attitude towards the rule of law and property rights. New Zealand legislation and legislation guidelines are clear. Legislation does not have retrospective effect. Legislation should respect property rights.

65. Yet, the Discussion Document contains proposals which would halve the NZU entitlement of existing forests, causing massive asset value losses and materially adverse impacts on existing forest investments and business arrangements. Proposals also target the 'stockpile' of existing NZUs, proposing to put an expiry date of those units and limit how they may be used and transferred, which has obvious price implications also.

66. The proposed changes operate retrospectively, as they undermine existing contracts and past investment decisions with no suitable avenue of recourse. For example, a forest owner with an ETS

registered forest and NZUs in its holding account could have its forest and NZU value decimated by the proposed changes.

67. First, the Government is proposing to halve the NZU entitlement of the forest – any asset that has its production halved is worth less. Second, the Government is proposing to put expiry dates on NZUs (making them worthless after expiry) and restrict how existing NZUs can be used, including only allowing sales of those NZUs to the Government – any assets which have an expiry date on their life arbitrarily imposed and restrictions on how they may be used are worth less.

68. Forestry investments are long-term investments, which has been consistently recognised under the CCRA and its regulations. Yet, part way through the life of existing forest and NZU investments made in good faith by Māori, farmers, foresters, councils and many others, the Government proposes to "reward" that valuable investment by stripping value from those investments. In this context, it is no surprise that new forest investments and forest planting have ceased.

69. Forest investors have already seen billions of dollars wiped from their balance sheets upon publication of the Discussion Document. The extreme nature of the proposals undermines existing investments and contractual arrangements and retroactively penalizes parties for prior investment and business decisions.

70. The Discussion Document (and other consultations such as the recent Tranche Two ETS Fee proposals) read as if the Government sees forestry ETS participants as a cash cow from which to milk value in any way it can. Whether that be massively increased ETS administration costs to fund a bloated bureaucracy, or through splitting the ETS so that the Government can buy NZUs from forest owners at a reduced rate so that the Government can on-sell units to emitters at an increased rate.

71. All investors across all sectors should be very concerned by the proposals contained in the Discussion Document.

72. The Government should be expected to respect the rule of law and respect property rights. No proposals should impact on existing forestry investments, existing entitlements to NZUs or indeed any existing NZUs. To the extent any law changes are to be made, they must be prospective only, meaning that they must only apply to

future ETS registered forests and future NZUs which have not yet been issued.

Yet again, the consultation process is a debacle.

73. The ink on our submission on the outrageous Tranche Two ETS Fee "consultation" (by which the Government ambushed the industry with a proposal to increase ETS costs by 1600%) is barely dry before the industry is inflicted with yet another "consultation" which seems intent on crippling climate forestry. Not to mention the contemporaneous consultation on permanent forestry and resource management law reform processes.

74. As previously submitted, our laws contain explicit requirements for consultation in the development and issuing of new laws. Care must be taken to ensure that proper consultation occurs, including that sufficient time is allowed for reviewing the provided materials and meaningful industry discussion. This guidance is reflected in the CCRA consultation provisions.[3]

75. A secret version of the current proposal was initially issued to a short list of select people under strict confidentiality provisions, giving them a couple of days to read it. Presumably those select few who received the draft could add little, not through any fault of their own, but rather because it takes more than a couple of days to read, analyse and respond to something of this magnitude. But, not to worry, the Government will tick that box to say that they pre-engaged with Māori and industry to ensure that the Discussion Document was fit for purpose.

76. The Government seems to consider that it is entirely reasonable to have armies of officials spend thousands of hours over many months producing hundreds of pages of detailed materials – and then give only a select few a couple of days to read it.

77. And then make unknown amendments to that secret draft before publicly releasing the document to everyone with only 8 weeks to read it and respond – even though it is acknowledged that being an election year nothing will happen with it until after the election in mid-October.

[3] Climate Change Response Act 2002, s 3A and 3B.

78. Mind you, the Discussion Document did not contain any of the crucially important modelling which was the basis of the proposals and the Government's argument that the ETS needs changing because forests will supposedly produce too many carbon credits in the future. Only after repeated and ongoing demands from submitters was the "modelling" released in dribs and drabs with only about 2 weeks to go in the consultation process.

79. We do not think it is too much to ask for our officials to run open, transparent, and collaborative consultation processes. We expect more from our officials, but we continue to be disappointed.

80. So, here we are again. Major regulatory reform is being proposed, with clearly underdone analysis to support dubious conclusions, but with very little time to consider the information available and respond. There has not been sufficient time to meaningfully digest and respond to the details provided in the "modelling". But, in the time we do have, we can say that it is wholly inadequate and that it does not support any change to the ETS.

Lip service paid to engagement with Māori, while Māori are disproportionately impacted.

81. Again, we are disappointed to find that we are repeating comments from previous submissions, in this case about the lack of meaningful engagement with Māori, particularly when the proposals expressly state that Māori will be disproportionality impacted.

82. The Discussion Document starts by apparently recognising the interests of Māori.

> ***Māori have a strong interest in the NZ ETS review***[4]
>
> *Māori have significant interests in the NZ ETS review. The operation of the NZ ETS affects Māori as forest owners, rangatira, kaitiaki, mana whenua, workers and business owners, communities, citizens, taxpayers, and everyday consumers who buy products that have the cost of carbon built into the price. The Government has also heard from Māori that more urgent climate action is required, with Māori communities disproportionately vulnerable and already facing the impacts of climate change.*

[4] Discussion Document, page 12

The Government is committed to embedding the Treaty of Waitangi | te Tiriti o Waitangi (te Tiriti) in the Crown's climate response. It is critical to consider Māori aspirations for kaitiakitanga and rangatiratanga of whenua and taonga in the NZ ETS review. Chapter 4 provides more detail on the impacts and opportunities for whānau, hapū, iwi and Māori.

83. The following statement is made in respect of all options considered in the Discussion Document. We strongly disagree with supposed benefits to Māori forest owners referred to above but agree that the increased NZU price will disproportionately impact Māori households.

Te Tiriti and Māori interests

Increases in NZU price (if sustained) will likely benefit Māori forest owners and the owners of land that is suitable for afforestation, due to the increases in returns from carbon. Opening the removals market to a wider range of buyers is also likely to provide more investment certainty within the sector.

However, the increased NZU price and consequent increase in household costs are likely to impact on Māori households, which are disproportionately represented in lower income groups.

84. Credit where credit is due: we welcome the Government being aware of Māori interest and participation in Climate Forestry. We assume that this acute awareness extends to an appreciation that the benefit of the carbon economy to Māori has been estimated at up to $16 billion, and that that represents the most significant value realisation of these otherwise marginal lands in a generation.

85. How incredible that despite being so aware, officials did not seek to engage with Māori forestry interests proactively, transparently, and respectfully in advance of this proposal – excluding perhaps 2 days of secret consultation with a select short list of people.

86. The CFA does not purport to speak for Māori, though we are proud of the relationship we have with Māori forestry interests, and proud of the work we have done together – such as developing the Code of Practice with Ngā Pou a Tāne, the National Māori Forestry Association.

87. We do however suggest that publishing this Discussion Document on these hugely material matters without such meaningful consultation

with Māori is deeply disrespectful, regardless of how aware the Government claims to be, and the shallow offer of inviting their submissions.

The Government proposals undermine market certainty, confidence and stability.

88. This section is a repeat from our submission on the "Tranche Two" ETS cost proposals earlier this year, which demonstrates that successive Government proposals continue to undermine certainty, confidence, and stability in the ETS market.

89. Regulatory and market certainty is a necessary ingredient for private sector operators to have the necessary confidence to make investment decisions and promote efficient economic activity. The more stable the landscape and the more predictable the Government's actions are, the more confidence businesses have to invest in the forestry ETS.

90. Continued significant and sudden changes to the ETS undermine that confidence. By massively shifting the regulatory landscape with limited notice and following a wholly inadequate consultation process, the Government is regularly signaling to potential new forestry ETS participants that the space is volatile and unpredictable, disincentivizing further investment and participation.

91. For the reasons given above, the proposals are detrimental to the industry at large as many participants and private sector operators may choose to exit or reduce their participation rather than investment good money to see the value of their assets stripped by Government law reforms.

92. If the Government proceeds with the proposed changes, there is a very real risk that existing forestry ETS participants will be dissuaded from continuing to operate in this market and that potential new participants will be dissuaded from participating. As a result:

    a. Private investment in sustainable land management, climate change mitigation and adaptation, managed transition of exotics to indigenous on unproductive lands – and the parallel ecological restoration processes they rely on – will cease or substantially reduce.

b. This will put a stop to forestry ETS projects at scale, removing both a significant economic opportunity for owners of unproductive and remote lands and the carbon sequestration activity New Zealand is reliant on to meet its carbon budgets.

c. There will be a deep reduction in the establishment of privately funded conservation estates (including funding on-going pest control in such areas) for the enjoyment of future generations and indigenous biodiversity.

d. Domestic carbon removals will reduce to such as an extent that New Zealand's international commitments will not be met without the transfer of billions of further taxpayer dollars offshore to help other countries transition to clean energy and climate resilient biodiverse landscapes.

93. A recognition that current and future forestry ETS participants need regulatory certainty is necessary if participants are going to continue to invest in NZ ETS.

94. While these proposed changes discourage involvement in the forestry ETS, MPI simultaneously claims in the Discussion Document and in other publications that supporting a thriving ETS space is necessary to meet our domestic emissions budgets, 2050 targets, and 2030 Nationally Determined Contribution under the Paris Agreement.[5] An explicit objective of the Climate Change Response (Emissions Trading Reform) Amendment Act 2020 was to encourage more participation in the forestry ETS. However, the current proposals achieve the exact opposite. The significant changes being proposed to the ETS will erode confidence in the ETS, which will stifle investment and inhibit New Zealand from meeting its pending climate targets when the UN and IPPCC are calling for urgent action,[6] during a Government-declared climate emergency.[7]

95. Not only does this create material risk to New Zealand's climate change initiatives and targets but is also at odds with the requirements of section 5ZG3(a) of the CCRA, which require the emissions reduction plan to include "sector specific policies to … increase removals". MPI's proposal will decrease removals, not increase them. If the Government intends to encourage and support

[5] "A review of the New Zealand Emissions Trading Scheme" (27 September 2022) at [7].
[6] AR6 Climate Change 2022: Mitigation of Climate Change — IPCC; Updated NDC Synthesis Report: Worrying Trends Confirmed | UNFCCC at [7.1.1]
[7] climate-change-emergency-and-whole-of-government-response.pdf (environment.govt.nz).

businesses thriving in NZ ETS with an aim towards meeting our climate goals, it cannot continue to erode confidence in the current system.

Conclusion

96. This Review is representative of an ideological crusade for the perfect climate solution, when we have a more than good enough one in the ETS. The Discussion Document ignores evidence to the contrary, while making some truly ridiculous assumptions about the future to justify these reforms. This Review and Discussion Document proposals are a shifting of the goalposts away from 15 years of policy and results, in a manner that would make New Zealand an extreme outlier compared to other countries.

97. Put simply, the Government's proposals will destroy the forestry industry (the mere publication of the Discussion Document has already had massive adverse impacts) and ruin its ability to contribute to netting off the worst of our climate impacts.

98. We need to throw everything we have at meeting the challenge of climate change – we don't have time to wait for ideologically pure outcomes, or redesigns, or dodgy policy options based on equally dodgy or secret data.

99. None of the options will get us closer to our climate targets – in fact, so far, we are getting further away. All the options will cost us billions, and result in us paying billions more for forests offshore. They'll cost jobs and employment and have us spend huge amounts overseas for something we can and should be doing at home.

100. We have an ETS that is good, and that is working. Forestry offsetting is the only part of our climate solution that is internationally recognised as adequate. Our gross emissions are falling. We have mechanisms inside the ETS that can control for the issues raised – even if we disagree that the case has been made for those issues.

101. We submit to you that this Review is wrong-headed, counterproductive to the point of being destructive, and ideologically blind to the facts of how the ETS works in practice, and how much of a success it has been and will continue to be.

102. We submit to you that this process needs to end, now. There is no logic to it, evidence for it, or improved outcomes to be gained from it. As a result of abandoning this foolhardy process, the New Zealand forestry community can get on with doing what we are doing so very well – sequestering carbon, for the benefit of New Zealand.

Answers to consultation questions.

Question 2.1: Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

We do not agree.

Any change of approach needs to be consulted upon widely, thoroughly and with a solid base of evidence. The approach that is being consulted upon risks ruining the Government's commitment to a fair transition, by passing on incredible costs to New Zealand households. It is simply not justified – and the case certainly has not been made – that there is a problem to solve, on the basis of forestry supply arguments that are just completely un-credible.

Question 2.2: Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

The ETS has been working as intended, and clearly providing a set of incentives to gross emitters given than gross emissions have been falling. New Zealand's emitters are reducing their emissions due to their social contract with New Zealanders. It is what we as the public, and what our trading partners, expect and require of them.

The biggest threat to this continued behaviour has been the chaos that has been introduced into the market for NZUs by this very consultation – which has ripped the bottom out of the NZU price. The impact of this process has also then been seen in destroying forestry confidence and leading to a near complete collapse of planting intentions for the next year. This will result in a "shock" to the market for seedlings and planting that will take three to five years to recover from – further distorting the incentives for gross emission behavioural change.

This process also ignores the evidence that emitters are likely to focus on reducing both their net and gross emissions in a complementary manner. This has never been binary – the ETS and gross emission cuts work together, and that is proven by emitter behaviour both here and overseas.

Question 2.3: Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?

We are deeply concerned that this process has shown such a cavalier attitude to these investments that significant damage has been done to the confidence of both foresters and investors. Unfortunately, we are also concerned that that damage has been done across the economy too, creating the risk of a chilled foreign investment market.

All investments require a reasonable degree of regulatory stability. This is particularly true of forestry investments, given the long-term nature of the commitment. This consultation is the latest in a long line of reviews – surely everything that there is to be known or explored about the ETS is known by now, rather than yet another attempt to move the goal posts.

Investment behaviour has been further disrupted by the unwillingness of the Government to confirm that any change will not be backdated. Why this extraordinary measure is not ruled out is completely baffling to us – as that in of itself is undermining forester and investor confidence to a significant degree.

Question 2.4: Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

No, we completely and utterly disagree with yet another set of anti-science, ideological statements. There is no credible basis for these statements and are instead a repeat of the talking points of the agricultural lobby – a lobby that has very successfully manipulated the public policy environment to avoid doing anything at all about their emissions.

We recommend consultation of the Te Taumata technical report on these points, which provides the best coverage of these issues from a scientific and forest ecology viewpoint.

Question 3.1: Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

We do not agree. There is no mandate, requirement or benefit to moving New Zealand's approach to focus on gross emissions.

This is not what the ETS was ever designed to do. No one has ever claimed we will get to our commitments solely through net emissions approaches – likewise, we will not get there through gross emissions processes only.

The current ETS approach leads to a working set of measures and incentives. Gross emissions are falling, and the revenue from the ETS supports other Government interventions to bring forward investments that address the sources of other hard to abate emissions.

Right now, we need to be doing everything we can to meet the climate crisis. Forestry and the ETS is the only part of our solution that is working at the scale we need it to.

Question 3.2: Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

No, we strongly disagree. We are alarmed with the lack of evidence on the impacts of these options, and the underestimation of the impact on New Zealanders – particularly those of lower incomes, and directly contrary to the Government's commitment to make a "just" transition.

This consultation is essentially about supply and demand. This process significantly overestimates supply, and then proposes to cripple forestry to ensure it cannot meet demand – artificially creating market scarcity.

In doing so, the economic impact will be far greater than leaving the ETS alone and allowing it to continue to work the way it is.

Question 3.3: How important do you think it is that we maintain incentives for removals? Why?

We think it is critical. We think that the ETS provides those incentives in a manner that is effective and is the only solution at scale New Zealand currently has to meet the climate crisis.

The land that is used for forestry in the ETS has limited other economic uses. This is why forestry in the ETS is so attractive to Māori landowners, and why Māori have described it as a once-in-a-generation opportunity for the Māori economy.

The risks of oversupply are overstated, as we have argued above and in our submission. In balance however, a hectare of land in forestry is far more beneficial to our climate commitments than a hectare left as pasture, given that agriculture is still left out emissions pricing. If the incentives then exist to convert some hard to farm parts of land, to the benefit of rural land owners as well as to the environment, surely this is a good thing.

Question 4.1: Do you agree with the description of the different interests Maori have in the NZ ETS review? Why/why not?

No, we do not agree. We will not shortcut the commitment Government has made to full co-design with Māori on these issues.

Question 4.2: What other interests do you think are important? What has been missed?

We think a number of other interests are important and have been missed:

- Fair process and reasonable consultation.
- Meeting commitment to co-design with Māori.
- Preserving the value of Treaty settlements.
- Meeting our net emissions-based climate commitments.
- Respecting the rule of law and providing a reasonable environment for long term investment.
- Adequate estimation of the costs and benefits of change.

To name but a few.

Question 4.3: How should these interests be balanced against one another or prioritised, or both?

Amongst other balancing measures, through meeting the commitment to co-design with Māori.

Question 4.4: What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

We see the risk of a once-in-a-generation economic opportunity being taken from Māori. That risk can be avoided by meeting the commitment to co-design.

Question 5.1: Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

No, we strongly disagree. We have covered this answer in our submission and also in our response to Question 3.1.

Question 5.2: Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

No, we disagree as this is never what the ETS was designed to do, aside from providing a stream of investment funds to Government to undertake these activities through separate policy.

Question 5.3: Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

We absolutely agree with this question. According to Climate Tracker, emissions removals via forestry is the only part of New Zealand's climate solution that is working.

Until such time as we have met all New Zealand's Nationally Determined Contribution, we are not at a sufficient level of abatement. This myth of holding some forestry potential in reserve for future hard-to-abate emissions – while at the same time purchasing foreign forestry-based units at incredible cost – is hypocrisy.

Question 5.4: Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

No, we strongly disagree.

The options assessment is, at best, an exercise in ideological navel gazing. There is no useful information upon which to assess the costs and benefits of these options. We have asked MfE to provide us with the data and analysis of the cost and benefits of these and have been alarmed to find that there is no such modelling.

What is missing is an Option Zero – an analysis of how the current settings inside the ETS can be used to achieve any policy outcomes, if indeed there are any to achieve above the status quo.

This review is an embarrassment. It needs to stop immediately.

Question 5.5: Are there any additional criteria or considerations that should be taken into account?

We would expect that any option would be assessed against:

- The status quo, and against the Option Zero of using settings inside the ETS as currently designed.
- The net cost to the economy and households.
- How well they enable New Zealand to meet our legislative and international treaty-based net emissions commitments.

Amongst other considerations, as we detail in our submission.

Question 6.1: Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

We fundamentally disagree with the basis of this question, as you will understand from our submission and answers above. There is no justification or mandate to pursue gross emission reductions through changes to the ETS.

In addition, all the options are not detailed sufficiently to provide an answer to this question.

Question 6.2: Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

No, as the level of assessment is wholly inadequate. Given that there is so little evidence provided in this consultation, we think it is a bit rich to ask for our evidence here.

Question 6.3: Of the four options proposed, which one do you prefer? Why?

We do not support any of the options proposed. We believe the status quo will be better for the climate and our emissions, and better for New Zealand, than all these options.

Question 6.4: Are there any additional options that you believe the review should consider? Why?

We believe that an Option Zero should be considered, of utilising the settings currently built into the ETS. We also believe there should be an honest and accurate assessment of the status quo as a base case.

Question 6.5: Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

We do not support any of the options.

Question 6.6: Do you agree with the assessment of how the different options might impact Maori? Have any impacts have been missed, and which are most important?

We do not support any of the options. Understanding the answer to this requires honouring the commitment to co-design with Māori.

Question 7.1: Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

We believe there are extensive co-benefits of the ETS. We have listed these in our submission.

We do not believe that there is much the Government could do to incentivise these co-benefits further, aside from abandoning this reform process.

Question 7.2: If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

All the options risk significant diminishment of co-benefits.

Question 7.3: Should a wider range of removals be included in the NZ ETS? Why/Why not?

We would welcome an adequate, scientific approach to asking this question. This consultation does not provide for that.

Question 7.4: What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

The best mechanism for realising these co-benefits would be for the Government to work with the forestry community to build this, together, rather than this continual pattern of review, submission, and ideologically driven attack on our sector.

CORPORATE TRUSTEES ASSOCIATION INCORPORATED

17 August 2023

NZ ETS review
Ministry for the Environment
PO Box 10362
Wellington 6143

Review of the New Zealand Emissions Trading Scheme

The Corporate Trustees Association (CTA) welcomes the opportunity to comment on your June 2023 Review of the New Zealand Emissions Trading Scheme (NZ ETS).

CTA is the industry association for New Zealand's five licensed supervisors. Collectively supervising over $500 billion assets under management, and licensed by the Financial Markets Authority under the Financial Markets Supervisors Act 2011, our members fulfil a statutory role under that Act to help enhance investor confidence in financial markets and retirement villages.

CTA members currently supervise three licenced Managed Investment Scheme managers specialising in forestry and several forestry or carbon related funds.

I attach our responses to those aspects of your consultation that are most relevant to the interests of investors. In summary, forestry investors interests need to be considered, so that the economics are well understood, and substantial investment already made are not unjustly impacted. Without certainty, further investment and contribution from forestry to New Zealand's climate objectives will not occur.

Please contact me if you require any further information from CTA members.

Angus Dale-Jones
Executive Director

Problem Statement

The NZ ETS review is looking to balance emissions reduction with emissions offsets. Under current settings the amount of land converting to forestry and registering in the NZ ETS could result in an oversupply, which could derail gross emission reduction in favour of cheaper carbon offsetting.

There are related objectives including managing the amount of farmland available for conversion to forestry via land use settings, optimising Māori interests, and incentives the planting of native forests.

Investors Interests

Investors in forestry schemes have several drivers, some invest for environmental reasons, however the vast majority aim to make positive financial returns. Forestry investments largely relate to exotic forests designed to earn income from both harvesting trees, and carbon units (Rotation forests). A small but increasing number of investments focus on permanent forests earning income from carbon only (Permanent forests).

Rotation forests returns are driven both by the NZ ETS unit price and log prices. The future price of both needs to be forecasted to consider the price of both to determine the returns to investors and the likelihood of further investment.

New Zealand has excellent growing conditions for exotic trees as they mature far faster here than many locations overseas. This gives New Zealand a competitive advantage in the establishment of sustainable multi rotation exotic forests. Many log producers overseas are not sustainable, and the resulting deforestation has kept international log prices low. As international pressure builds, and there are less places available for non-sustainable forestry log prices are likely to rise. The increase in the prevalence of forest fires in highly afforested places (including USA, Canada, and Russia) will also increase log prices.

Permanent forests investment returns are almost entirely driven by the NZ ETS price. Without a strong and consistent NZ ETS price, these schemes will fail. In addition, no new Permanent forests will be established by investors. This would be detrimental for both carbon reduction and biodiversity reasons.

Investors make decisions based on current and forecasted NZ ETS prices. Forecasts are over long periods of time (often 25 years or more). To make informed decisions investors need high quality information, transparency, and consistency in policy settings.

Significant changes to policy settings can cause material detriment to investors. It can also lead to uncertainty which will delay investment decisions and may deter investors leading to possible underinvestment.

2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

The government's modelling suggests that, under current NZ ETS settings, the total supply of NZUs could exceed the demand for units from participants with surrender obligations in the NZ ETS from the early 2030s.

In 2022, the Climate Change Commission (CCC) estimated the surplus component of the stockpile to be between 33 million to 66 million NZUs. The number of surplus units began increasing in 2012. This growth was attributed to the arbitrage of Kyoto Protocol units for NZUs (which has been prohibited in the NZ ETS since 2015), some banking of Kyoto Protocol units (which were cancelled in 2019), the one-off allocation of NZUs to pre 1990 forest owners, the use of the fixed price option by NZ ETS participants in 2019 and 2020, and the sale of NZUs from the cost containment reserve in 2022.

Investors have an incentive to stockpile units if they believe the price of units will go up. They are likely to sell units from their stockpile if prices are likely to go down. The governments modelling assumes a fall in prices and a reduction in stockpiled units.

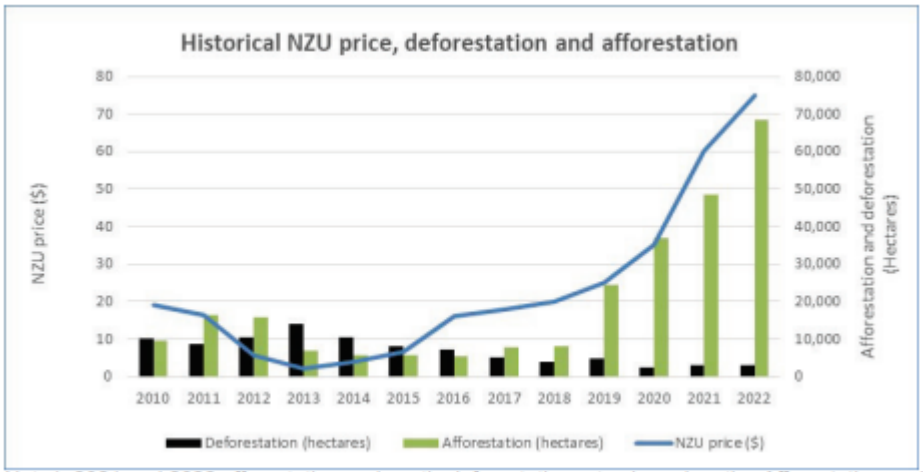
The government modelling assumes the price of NZU's will fall, investors who have been stockpiling units believe the price will rise. There appears to by an asymmetry of information as the market does not seem to be pricing in the government's assumptions.

The modelling does not explicitly state its assumption regarding the inclusion of agriculture in the NZ ETS. However, as agriculture creates approximately half of all New Zealand's emissions it can be assumed that the government model assumes the agriculture will not be included (as demand for NZ ETS units is expected to go down rather than up).

MPI's afforestation assumptions are based on a survey conducted in late 2021 when NZU prices were high, and many investors expected agriculture to be included in the NZ ETS in the future.

MPI's modelling[1] appears to ignore the market response to a fall in the NZU price. There is a strong corelation between the NZU price and afforestation/deforestation. The graph below shows this correlation. With a falling NZU price in 2010 – 2013 there was an increase in deforestation and a decrease in afforestation in the years 2012 – 2016 (there is a lag effect). With a rising NZU price in 2015 – 2022 there was in decrease in deforestation and an increase in afforestation in the years 2017 – 2022 (there is a lag effect).

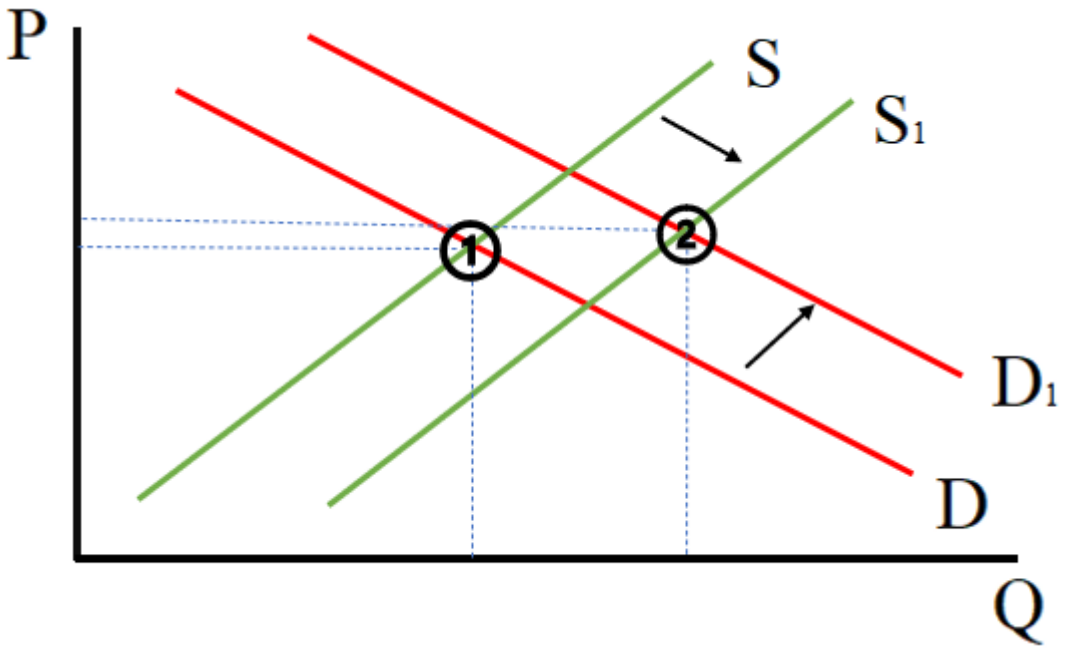
[1] https://www.mpi.govt.nz/dmsdocument/58120-New-Zealands-Emissions-Trading-Scheme-Forestry-Allocation-and-Surrender-Forecasts



Set out below are expectations of investor behaviour with regard to NZU prices in three scenarios.

Scenario 1.
Inclusion of agriculture into the NZ ETS.

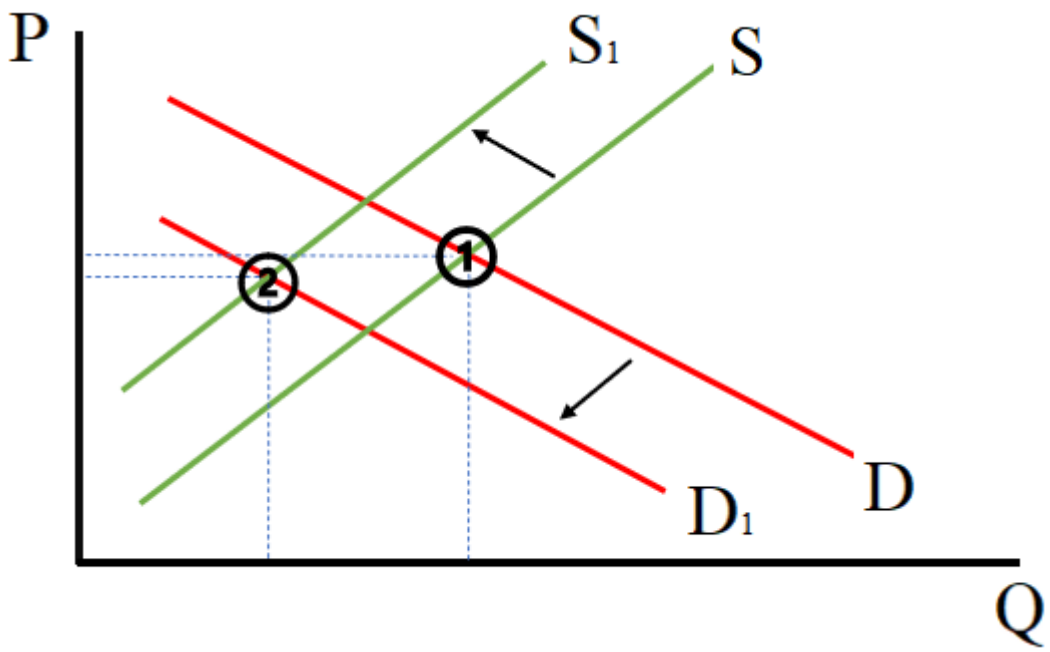
If agriculture is included in the NZ ETS regime, investor behaviour would be expected to follow the demand and supply graph below. Because agriculture represents around half of all New Zealands emissions, the demand for NZU's would increase (D – D1) driving up NZU prices (and the price of land suitable for forestry). In time further supply would be added through afforestation (S – S1) increasing the quantity of NZU's and bring the NZU price down. The equalibribium would move from point 1 to point 2.



Scenario 2.
Agriculture not included. NZ ETS status quo.

If agriculture is not included in the NZ ETS regime, investor behaviour would be expected to follow the demand and supply graph below. As non agricultural emissions reduce over time, the demand for NZU's would decrease (D – D1) driving down NZU prices (and the price of land suitable for forestry). In time, supply would be removed through deforestation (S – S1) reducing the quantity of NZU's and bring the NZU price up. The equalibribium would move from point 1 to point 2. This scenario may lead to an insufficient amount of sequestration to allow New Zealand to meet in Paris Agreement responsibilities. Option 2 would be required to keep the price of NZU's high enough. This would maintain the equilibrium at point 1.

The net approach is aligned with the Paris Agreement and acknowledges the necessity of carbon sinks to offset hard to abate sectors.



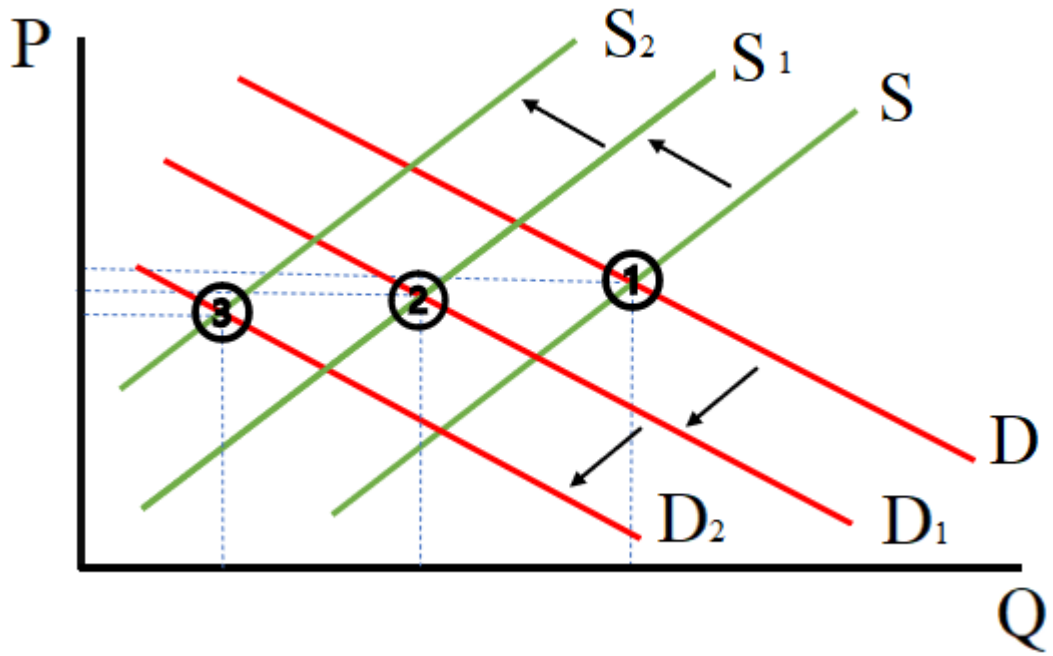
Scenario 3.

Agriculture not included and Option 3 or 4 is introduced. Option 2 is not applied.

If agriculture is not included in the NZ ETS regime, and options 3 or 4 are introduced, investor behaviour would be expected to follow the demand and supply graph below. As non agricultural emissions reduce over time, the demand for NZU's would decrease (D – D1) driving down NZU prices (and the price of land suitable for forestry). In time supply would be removed through deforestation (S – S1) reducing the quantity of NZU's and bring the NZU price up. The equilibrium would move from point 1 to point 2.

As reduction NZU's are utilised under options 3 or 4, this would reduce the demand for forestry NZU's further (D1 – D2) driving down NZU prices (and the price of land suitable for forestry) In time supply would be further removed through deforestation (S1 – S2) reducing the quantity of NZU's and bring the NZU price back up. The equilibrium would move from point 2 to point 3.

This scenario may lead to an insufficient amount of sequestration to allow New Zealand to meet in Paris accord responsibilities. Option 2 would be required to keep the price of NZU's high enough. It is likely that the cost of Option 2 would be higher if Option 3 or 4 were introduced than Option 2 on its own.



6.3 Of the four options proposed, which one do you prefer? Why?

Of the four options, Option 2 is preferred. Option 2 provides support for the NZU price so that sufficient investment is made in forestry to support investment, and to allow New Zealand to meet in Paris Agreement responsibilities.

If Option 3 or 4 are implemented, Option 2 should be applied at the same time.

An attempt to control the price of a forestry Unit (Option 3 or 4 alone) would drive uncertainty and reduce the demand for forestry NZUs. These Options do not recognise the perpetual economic, social and environmental benefits that production forestry provides.

The NZ ETS should not be overcomplicated or create a heavy burden of administration under scenarios where dual systems are managed with requirement for constant maintenance.

The NZ ETS should not separate the price of a forestry Unit from other emissions Units. Current rules have driven afforestation, it would be unjust to affect the value of those forestry Units retrospectively.

6.4 Are there any additional options that you believe the review should consider? Why?

The government could consider controlling the supply by managing the amount of land eligible under the NZ ETS. Through the NZ ETS, allocate the amount of land (hectares) eligible to participate in the NZ ETS on an annual basis. Land to be allocated through a consenting process on an area by area (e.g. farm) basis and in line with the CCC's recommendations of afforestation requirements for that year.

Limiting the amount of land going into the NZ ETS would negate the requirement to create a differentiated carbon price for forestry Units, allowing NZUs to trade freely and over time, increase in line with forecasts, encouraging emitters to reduce emissions.

Consenting system for NZ ETS eligible hectares: Under a consents system, participants can apply for NZ ETS eligible hectares within scope of recommendations provided by the CCC, based on suitability of land among other metrics. Such a system may include a per hectare fee payable to MPI for administration.

Consideration of whole farm conversions where some minor areas of a property might include Land Use Capability LUC Class 1 to 5 but without a feasible way to carve this area out. Land eligibility should not be managed at a regional/council level, where other motivators may obscure New Zealand's climate change commitments. Forestry is a long-term investment requiring long-term thinking and certainty.

Consents should be issued per forest/property and in a timely manner. Consents should not be issued to participants on a speculative basis, i.e. must correspond to land purchased or under contract.

In addition, limitations of NZ ETS eligible hectares for Exotics and Natives may be appropriate. The CCC could advise on the level of afforestation required annually, governing the availability of NZ ETS eligible hectares based on species and management (production or permanent).

Some investors have a view that exotic forests should not be included in permanent forests category. This is at odds with the views of many carbon farming investors.

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

Existing forests could be grandfathered into the new NZ ETS regime on the existing policy settings. Changing the policy settings could be materially adverse to investors for a range of reasons.

A large number of forest owners have entered into hedging arrangements on terms fixed under the current policy settings. Policy changes may result is significant losses to those with hedges and may lead to defaults under the terms of the hedging arrangements.

A large number of forest owners have leverage with borrowings from a range of financiers including several NZ Banks. The terms of these debt facilities were agreed on terms fixed under the current policy settings. Policy changes may result is significant losses to those with debt and may lead to defaults under the terms of the funding arrangements. The current uncertainty around the NZ ETS settings is influencing financiers decisions to lend to forestry and some permanent forestry investments have been put on hold.

NZ ETS revenue is used to pay distributions under very long investment horizons. Funds that were established under existing settings may not be able to make distributions to investors if the settings change. In a worst-case, funds may not have enough income to function and may need to be terminated / wound up. This has a heightened risk for Permanent forestry (carbon farming) that almost entirely rely on income from selling NZUs.

At this stage, there is significant uncertainty in the NZ ETS for both emitters and foresters, the current signalling of rules (NZ ETS and Land Use) has removed confidence in the market (buying has ceased) and immediately land suited for forestry has significantly decreased in value, creating economic instability.

Conclusion

Forestry investors interests need to be considered, so that the economics are well understood, and substantial investment already made are not unjustly impacted. Without certainty, further investment and contribution from forestry to New Zealand's climate objectives will not occur.

11 August 2023

Ministry for the Environment
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Submitters

Heritage Forestry Lawrence Ltd is a small private company that has owned a forestry block of approximately 800ha near Lawrence Otago since mid-1990's. The company's forest has been registered in the various schemes promoting carbon sequestration for well over 10 years being one of the original participants in the PFSI scheme. The company is in the process of planting further blocks on land that has little productive value from an agricultural perspective, with plantings being carried out in partnership with farmer landowners seeking to get a return on non-productive parts of their properties and provide a hedge against future agricultural emissions costs.

General

We have been extremely frustrated by the various consultation processes and government announcements that have resulted in uncertainty and huge volatility in the carbon price over the period in which we have been involved.

We have entered into a forward contract to supply 20,000 NZUs each year until 2028, therefore changes to the treatment of forest offsets would likely have significant implications for the company.

As mentioned above, we are currently in the process of planting two new forests of approximately 100ha each that are intended to remain as permanent forests. The tree species is to be Eucalyptus as it has zero wilding spread risk, is tolerant to a wide range of growing conditions and grows quickly.

Advice we received regarding native plantings indicated that there would be a much higher cost to get them established, particularly where there was a significant pest weed presence, that there would likely be a high failure rate, the growth rate would be very slow, the carbon sequestered in a mature native forest would be substantially below that of Eucalyptus, and the financial returns, even at an $80 carbon price, would not stack up. Therefore, native planting was ruled out as being inappropriate.

These projects are already progressing with trees to go in the ground in the next few months, so we would be extremely frustrated and suffer a significant financial loss if the rules were changed in a way that impacted the expected carbon credits generated from these projects.

We understand that New Zealand has a 99 million tonne shortfall in our 2030 targets and the current expectation is that this shortfall will be offset by purchasing offshore credits at a currently-unknown cost. However, let's say that the acquisition cost is consistent with the current NZ carbon price of $61.00/T, there will be $6 billion of taxpayers' money going offshore for which we get nothing in return.

We accept that exotic mono-culture forests are not the perfect solution to the greenhouse gas problem, however they provide a relatively quick and effective method of offsetting gross emissions and, where they are planted in non-productive

areas to replace pest weeds such as gorse and broom, they deliver a net positive ecological outcome also.

The government must send a strong message regarding objectives for afforestation and carbon removals with parameters regarding appropriate areas and plantings to give stakeholders a robust framework for confident decision making.

Review of the New Zealand Emissions Trading Scheme

Our understanding of the issue that this consultation is trying to address is that the expected supply of NZUs generated from forestry offsets is likely to exceed the demand for NZUs from emitters. However, on a national basis New Zealand still has an overall shortfall, estimated to be 99 million tonnes in the 2030 commitment period, primarily due to agricultural emissions not being subject to the ETS.

The result of this in a forestry context is that New Zealand requires the additional offsets generated from further afforestation to meet its international commitments, but there will be insufficient demand for units from domestic emitters to take up these units and maintain a carbon price at a level that incentivizes gross emission reductions.

Figure2: Projected net emissions and target pathways to 2050 shows that by 2050 NZ still has net emissions of around 32 million tonnes illustrating that the country still has a need for the offsets generated from exotic forestry.

Figure 4: Forecast New Zealand Unit supply and demand in the New Zealand Emissions Trading Scheme demonstrates that the supply of units from forestry is expected to significantly exceed demand from emitters.

The conclusion from these charts is that New Zealand needs the units from forestry to meet its net zero target, but foresters are not going to be paid for those units by emitters unless the agricultural industry is included in the ETS.

If NZ is going to have to meet any shortfall by purchasing international credits, the government should commit to purchasing units from domestic foresters as the effect is the same from the perspective of NZ's carbon commitments. The purchase price offered by the government would need to be set at a level to ensure that there was no incentive for widespread deforestation.

It appears to be generally accepted that a gross emissions reduction is a higher quality reduction than an offset and comes at a higher price, therefore it is logical that the value attributed to an offset be lower than the value attributed to a gross reduction.

In relation to the options presented:

Option 1 Decrease the amount of emissions units so that the carbon price rises

In the short-term this would incentivise polluters to reduce emissions faster and landowners to plant more trees. In the long-term with more removals from activities like forestry the price of carbon would be likely to drop.

Having the carbon price increase too high too quickly, particularly where technology that can deliver gross reductions is yet to be commercialized, carries the risk of forcing business to relocate to jurisdictions with a lower carbon cost. The net effect being that overall emissions increase, and NZ is worse off.

It is important that supply is appropriate to meet demand in a managed way, however if emitters have stockpiled units that suggests that there has already been an

oversupply. The lack of demand at recent auctions also suggests that there has been an oversupply of units to date.

This option only delivers a short-term result that does not address the longer-term supply/demand issue and fails to deliver any additional certainty for long-term decision making.

Option 2 Increase the demand for emissions units by allowing the Government and/or overseas buyers to purchase them

This may raise the price of carbon, incentivising emissions reductions and removals. But this option includes a lot of uncertainty, and demand from overseas carbon markets is likely to be limited.

It makes no sense for offshore buyers to acquire NZ units where those units count towards New Zealand's NDC. Under such a scheme the credit for the reduction would be getting claimed twice, by NZ and by the offshore purchaser which would make NZ party to greenwashing.

With gross reductions having a higher value to New Zealand than offsets, the government should have a more targeting approach to using taxpayer money to fund net emissions reductions.

Option 3 Restrictions or conditions are placed on removal activities

This means emitters will need to purchase more emissions units from the Government or draw from stockpiled emissions units. This may encourage emitters to reduce their emissions, but it may not encourage new forests to be planted.

The effect of creating separate prices for reduction activities and removal activities makes sense, however this option, as outlined, fails to address the longer-term problem of an over-supply of units from removal activities and will likely further reduce demand for the removal units.

This option needs to include a facility whereby the government purchases surplus units in order to maintain the incentive for afforestation to meet NZ's NDC, and, potentially more importantly, avoid destroying the value of removal credits and driving deforestation. The price setting mechanism for the government would need to be carefully considered, the government's cost of sourcing offshore units to meet its NDC would be relevant in this.

This option needs to be employed along the lines of imposing restrictions or conditions on the units that NZ ETS participants can surrender as part of the surrender obligations generated through removal activities. That way there can be a managed transition from the current position to the split-price position allowing participants to plan ahead and avoid undermining the value of decisions they have made in the past.

This option also provides a framework for the government to tailor conditions by industry to adapt as technological reduction options become available.

It is important that under this scheme, foresters with a surrender obligation can surrender units arising from removal activities, i.e. forestry surrender obligations can be met with units generated from forestry.

Option 4 Emitters will not be able to purchase NZUs from foresters to pay for their greenhouse gas emissions

Emitters would purchase more New Zealand Units (NZUs) from the Government instead. The Government could purchase the removals from forestry to ensure new forests continue to be planted.

The objectives delivered under this option can also be achieved under option 3. Pursuing this option is likely to create a lot of additional delay, cost and uncertainty during the design phase, particularly as participants have to manage their way out of existing arrangements.

FEDERATED FARMERS OF NEW ZEALAND

Review of the New Zealand Emissions Trading Scheme

Submission by Federated Farmers of New Zealand

11 August 2023

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SUBMISSION TO THE MINISTRY FOR THE ENVIRONMENT ON THE REVIEW OF THE EMISSIONS TRADING SCHEME DISCUSSION DOCUMENT

TO: Ministry for the Environment

DATE: 11 August 2023

ADDRESS FOR SERVICE

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ABOUT FEDERATED FARMERS

Federated Farmers of New Zealand is a membership organisation, which is mandated by its members to advocate on their behalf and ensure representation of their views. Federated Farmers does not collect a compulsory levy under the Commodities Levy Act and is funded from voluntary membership.

Federated Farmers represents rural and farming businesses throughout New Zealand. We have a long and proud history of representing the needs and interests of New Zealand's farmers.

Federated Farmers aims to empower farmers. Our key strategic priorities as an organisation are that we:

- Be the respected voice of farming.
- Foster an inspired leadership network.
- Support vibrant rural communities.

SUBMISSION TO THE MINISTRY FOR THE ENVIRONMENT ON THE REVIEW OF THE EMISSIONS TRADING SCHEME DISCUSSION DOCUMENT

1. SUMMARY

1.1. Federated Farmers believes Option 3 represents the best option to achieve climate goals sustainably for farmers and rural communities. Federated Farmers also believes that Option 4 could also be a good option if adequately implemented. How either Option 3 or 4 are implemented will be very important. No matter the option chosen, we encourage the Government to work with farming groups, such as Federated Farmers, to ensure that the unique characteristics of farmers and rural New Zealanders are adequately considered.

1.2. In March 2022, the National Council of Federated Farmers of New Zealand approved a revised policy on 'Government policies incentivising the blanket afforestation of farmland'.[1] One of the eight policies included in this paper was that *"The Emissions Trading Scheme (ETS) be amended to limit how many forestry units participants can surrender for non-forestry related activities."* This option is most aligned with Option 3 in the discussion document.

1.3. Federated Farmers firmly believes that Options 1 and 2 would be devastating for farmers and rural communities and would leave New Zealand even further out of step with international best practice. Further increasing the demand for forestry offsets will likely significantly harm food production, increase global emissions via emissions leakage and likely undermine political support for the ETS overall. Federated Farmers have been calling for action on this issue for years and does not support a 'do nothing' approach.

1.4. Federated Farmers would like to use this Review of the ETS as an opportunity to repeat previous requests for the Government to remove the current 'backstop' of bringing agricultural emissions into the ETS at the processor level and with full fungibility between long and short-lived emissions. In 2022 Federated Farmers described the processor-level ETS 'backstop' as a show of poor faith by the Government and one we opposed when it was announced with the 2020 Climate Change Response (Emissions Trading Reform) Amendment Bill and SOP 413. We maintain this view.

2. INTRODUCTION

2.1. Federated Farmers of New Zealand (Federated Farmers) welcomes the opportunity to submit to the Ministry for the Environment (MfE) on the 'Review of the Emissions Trading Scheme' discussion paper (the discussion paper).

2.2. Federated Farmers has been a frequent and detailed submitter on climate change policy and legislation. We are a partner in the He Waka Eke Noa Primary Sector Climate Action Partnership. The Ministry should be familiar with Federated Farmers'

[1] https://fedfarm.org.nz/FFPublic/FFPublic/Policy2/National/2022/Policy_Position_on_Government_Policies_Incentivising_the_Afforestation_of_Farmland_.aspx

policy positions on climate change and on the New Zealand Emissions Trading Scheme (NZ ETS).

2.3. Federated Farmers also regularly submits on forestry policy. In early 2022 Federated Farmers updated our forestry policies, providing solutions to the government policies incentivising the afforestation of farmland. The NZ ETS is one of the most significant of these policies. Our 2022 policy position can be access on the Federation's website[2]. The first policy in the 'Government policies incentivising the afforestation of farmland' policy paper by Federated Farmers is

"The Emissions Trading Scheme (ETS) be amended to limit how many forestry units participants can surrender for non-forestry related activities."

2.4. Federated Farmers welcomes the Government tasking officials with carrying out a review of NZ ETS forestry rules. Our farming members are firmly of the view that current NZ ETS settings are significantly artificially distorting land-use decisions away from their most productive and sustainable use and in doing so, significantly harming the social, economic and environmental well-being of rural communities.

2.5. This submission is split into two parts. Section 1 outlines our general views on the discussion document and potential policy options that could be considered further by the Government. Section 2 provides direct responses to questions included in the discussion document.

[2] https://fedfarm.org.nz/FFPublic/FFPublic/Policy2/National/2022/Policy_Position_on_Government_Policies_Incentivising_the_Afforestation_of_Farmland_.aspx

SECTION 1: GENERAL VIEWS ON DISCUSSION DOCUMENT AND FORESTRY

3. Defining clear problem definitions

3.1. The discussion document touches on a variety of challenges with the current policy settings. These include, but are not limited to,

- A gap between projected net emissions and New Zealand's 2030 target under the Paris Agreement (page 17)
- The ETS causing too much offsetting and not enough gross emissions (page 19)
- The negative social and economic impacts of inappropriate afforestation (page 19, page 69)
- The negative environmental impacts of inappropriate afforestation (page 19)
- The risks to permanence, additionality and accounting integrity associated with the biological sequestration of carbon, such as fire and pests (page 20)
- Current prices potentially not being sufficient to reduce gross emissions from energy, transport and industry (page 20)
- Levels of indigenous afforestation lower than Climate Change Comission recommendations (page 20)
- Limited removal alternatives (page 20)
- Projected falls in New Zealand emissions prices (page 26)
- Reduced export revenue due to significant land-use change to forestry (page 29)

3.2. In response to all of these issues, four unified options are put forward:

3.2.1. Option 1: Decrease the amount of emissions units so that the carbon price rises and demand for forestry units increases.

3.2.2. Option 2: Increase the demand for forestry emissions units by allowing the Government and/or overseas buyers to purchase them

3.2.3. Option 3: Distinguishing between gross emissions reductions and emissions removals in the price paid within the NZ ETS.

3.2.4. Option 4: Create a separate market for removals distinct from the NZ ETS. Removals would then be purchased by the government, emitters or both.

3.3. The Government should do more to articulate the problem or problems clearly, which it is trying to solve. Just as a diverse range of policy interventions has created a range of problems articulated in the discussion paper, more than one policy solution is likely needed to address some or all of the problems. For example, the fire risks associated with inappropriate permanent exotic afforestation will need a different policy solution to perceived low levels of indigenous afforestation.

3.4. Federated Farmers views that Options 3 and 4 offer the potential to solve the primary issues relating to the economic and social impacts of large-scale afforestation on rural

communities. However, other problems identified in the discussion document will require entirely different policy responses. These are also briefly outlined in our submission.

3.5. Federated Farmers notes that Option 1 and Option 2 will likely further exacerbate the distortionary policy incentives, artificially driving productive farmland into monocultural blanket pine afforestation. We do not support these options.

3.6. We note that some problems identified in the Discussion Document are not well argued (and may not be problems at all). For example, the Discussion Document is concerned that emissions prices may fall. It is hard to see how this is a problem in a vacuum. In the event that New Zealand maintains a carbon budget in line with international expectations, falling prices may simply be a sign that New Zealand has successfully achieved emissions targets. Hon James Shaw, Minister for Climate Change has in fact stated,

"In the ideal world, the carbon price would actually be zero".[3]

3.7. While perhaps not an issue if carbon budgets function properly, such a scenario also highlights the serious flaws with New Zealand's policy of having science-based split gas targets but unscientifically allowing the full fungibility of short and long-lived emissions in carbon budgets. Offsetting changes in long-lived emissions (such as carbon dioxide) with changes in short-lived emissions (such as biogenic methane) risk emissions budgets becoming out of step with warming outcomes. This was noted in Chapter seven of the sixth assessment report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) for the United Nations (UN). Which states (emphasis added):

"In summary, new emission metric approaches such as GWP and CGTP are designed to relate emission changes in short-lived greenhouse gases to emissions of CO2 as they better account for the different physical behaviours of short and long-lived gases. Through scaling the corresponding cumulative CO2 equivalent emissions by the TCRE, the GSAT response from emissions over time of an aggregated set of gases can be estimated.* ***Using either these new approaches, or treating short and long-lived GHG emission pathways separately, can improve the quantification of the contribution of emissions to global warming within accumulative emission framework, compared to approaches that aggregate emissions of GHGs using standard CO_2 equivalent emission metrics****...*

By contrast, if emissions are weighted by their 100-year GWP or GTP values, different multi-gas emissions pathways with the same aggregated CO2 equivalent emissions rarely lead to the same estimated temperature outcome (high confidence). *{7.6.1, Box 7.3}."*[4]

3.8. A consistent split gas approach should be applied to New Zealand's emissions reduction policy framework. This should include taking a split gas approach to emissions budgets, NDCs, emissions inventories, pricing signals and life cycle

[3] See here (5:00) : https://www.newstalkzb.co nz/on-air/mike-hosking-breakfast/audio/james-shaw-climate-change-minister-on-government-u-turn-on-emissions-trading-scheme-settings/

[4] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07.pdf , pp. 927-928

assessments. More information on this recommendation can be found in numerous previous submissions by Federated Farmers relating to climate change.

3.9. Federated Farmers submits that the following key problems require further investigation:

3.9.1. High blanket afforestation levels are causing negative social and economic issues in rural communities.

3.9.2. Poor (or no) forest management leads to negative environmental outcomes, such as increased fire and pest risk.

3.9.3. Foreign investor rules artificially favour forestry, distorting land-use decisions away from agriculture.

3.9.4. The various co-benefits of native afforestation are not recognised (carbon sequestration has a strong price signal, but co-benefits do not).

3.9.5. There is a risk of investor flight after most carbon credits have been transferred from the Government to forest owners.

3.9.6. Current policies are resulting in reductions in New Zealand food exports, decreasing global food security, driving emissions leakage and increasing global emissions.[5]

3.10. The following sections discuss each of these issues in detail and propose policy responses.

4. Social and economic issues

4.1. Historically, New Zealand government policy has at times attempted to steer land-use decisions in directions that favour the political aims of the time. This included subsidised loans for land development, special assistance for clearing of land for agriculture that likely would not have been economical to clear, and garanteed minimum pricing.

4.2. Such government policies have always been unsustainable in the long term in New Zealand. This is partly due to the dominance of agricultural products in New Zealand's export profile, meaning government payments for land use have not been fiscally sustainable as they have been in overseas countries where agricultural subsidies deleteriously remain to this day. As subsidies have been removed, communities have no longer been able to sustain the land-use decisions driven by government subsidies. This has seen rural communities suffer through sustainably increased unemployment, deindustrialisation and depopulation as land has been de-intensified, retired, and agricultural processing shut down.

4.3. Current forestry NZ ETS policies are also significatly artificially distorting land use signals and distorting land use. Current government policy artificially places a price on carbon removals, and New Zealand is the only country in the world to both include the

[5] https://fedfarm.org.nz/FFPublic/FFPublic/Policy2/National/2022/Submission_on_the-Pricing_Agricultural-Emissions-Consultation_Document.aspx

entire forestry sector in an ETS and to allow emitters to offset 100% of surrender obligations with forestry credits.[6] Analysis by Beef + Lamb New Zealand (B+LNZ) (Figure 1) shows that a $70 carbon price is enough to shift land that *is* economic in pasture without a carbon price, to be much more economic in forestry with a carbon price.

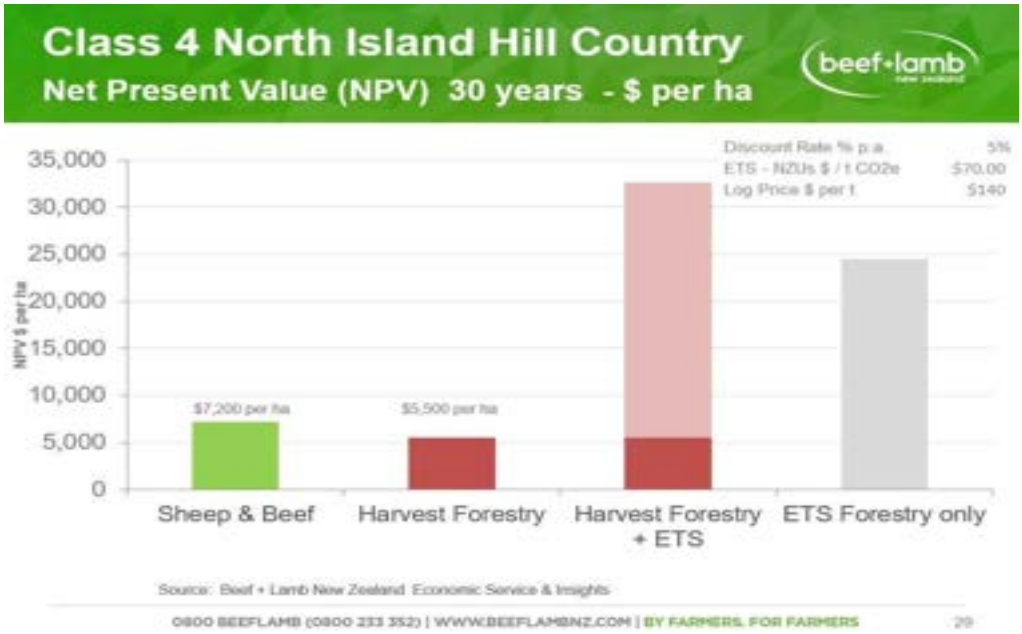


Figure 1: North Island Hill Country land economics under a $70 NZU price

4.4. The report 'Land-use change from pastoral farming to large-scale forestry: Update' (August 2022) by Orme & Associates Limited covers the consequences of this artificial change in land-use economics. The report, commissioned by B+LNZ's Economic Service, records 175,000 hectares of farmland converted to forestry via whole farm conversions. Once again, the consequence of this government-driven land use change is reduced rural employment and population.[7]

4.5. The current spike in land-use change, just like many historic spikes in land-use change, is driven by government policy rather than global market signals. Should government policy change in the future, the carbon price will change in response, and land use economics with it. Unlike products such as milk, beef, lamb and timber, consumers are not demanding NZUs, but rather are forced to purchase such units by the government. The current spike in afforestation is not being driven by voluntary carbon markets. While many companies are looking to increase the use of voluntary carbon offsets, others are moving away from such an approach (such as Nestle).[8]

4.6. It is noteworthy that the Climate Change Response Act has had six major amendments since the emissions trading scheme was included in the Act in 2008, an average of one major policy change every two and half years. In addition, Ministerial decisions on

[6] https://beeflambnz.com/news-views/nz-international-outlier-allowing-100-emissions
[7] https://beeflambnz.com/sites/default/files/Wairoa%20Afforestation_FINAL.pdf
[8] https://www.just-food.com/news/nestle-to-walk-away-from-carbon-neutral-claims/

auction volumes can also heavily impact prices. Figure 2 shows how NZU prices have responded to this constant policy change and Ministerial decision making. This suggests that further policy and price changes can be expected in the future. A compelling example of the impact Ministerial decision-making can have on the NZU price was the NZU price dramatically increasing by about 50% following the Government making an ETS auction settings policy change announcement on the 25th of July (within this consultation period).[9]

4.7.

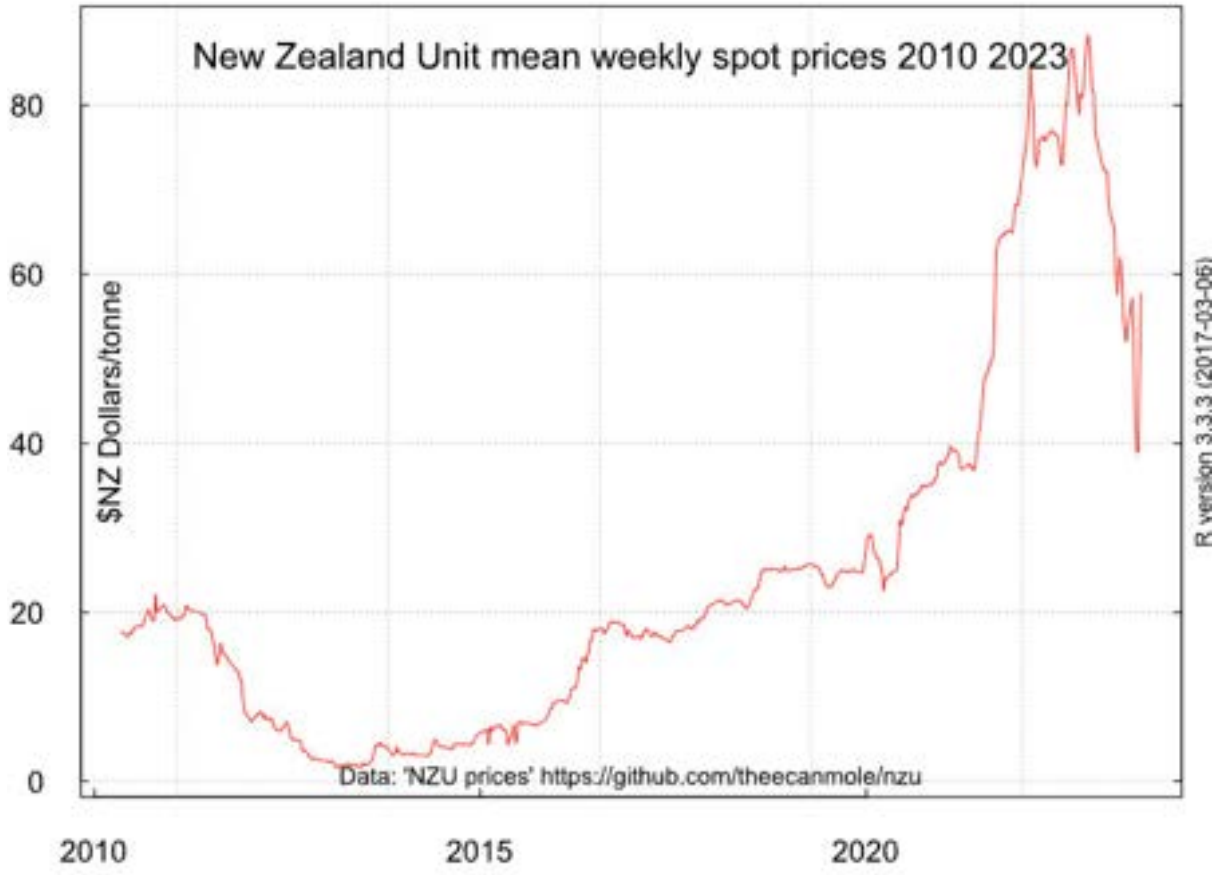


Figure 2: NZU weekly mean price 2010 - 2024[10]

4.8. The emissions trading scheme sends an appropriate long-term signal to users of fossil fuels. A wildly fluctuating emissions price will still only have a moderate impact on petrol or electricity prices, for example. These wildly fluctuating emissions prices can have hugely damaging effects however when they are used to drive land-use decisions that are largely irreversible. This is being observed in rural communities throughout New Zealand who currently feel under siege from new forest plantings, but may in a few years, see bankruptcies if the carbon price once again falls.

4.9. There is a compelling case to moderate the extent to which the NZ ETS and subsequent politically imposed price on carbon is allowed to drive long-term irreversible land-use decisions across New Zealand. Options 3 and 4 would bring New

[9] https://environment.govt.nz/news/government-announces-updated-nz-ets-auction-settings/
[10] https://github.com/theecanmole/nzu/blob/master/NZU-spot-prices-720by540.svg

Zealand in line with the policy frameworks in place globally, would give the government an ability to send distinct emissions removal and reduction signals and, **therefore either option should be implemented. Our preference is Option 3.**

4.10. Forestry entered into the NZ ETS is not an example of a free market in which producers respond to consumer demand, but is rather an example of a voluntary contract between land owners and the Government. Land owners with post 1989 forestry do not have to enter this forestry into the NZ ETS, but choose to do so to accrue increasingly valuable NZUs. The government applying conditions to forestry projects that wish to voluntarily enter the NZ ETS, is fundamentally different to the government applying regulations that applies to all forestry in New Zealand. .It is therefore appropriate for the Government to make changes to the ETS that improve the sustainability of forestry offsetting projects and which bring the operation of the NZ ETS in line with similar schemes internationally.

4.11. Federated Farmers, our farming members, other farming organisations (such as B+LNZ, the Meat Industry Association, and 50 Shades of Green), numerous local authorities, numerous green non-governmental organisations, media commentators, and high-profile academics have all been raising concerns about the severe issues being caused by unbalanced and distortionary forestry NZ ETS settings for years. An announcement of changes in how forestry is treated in the NZ ETS would not come as a surprise to an informed NZ ETS participant.

4.12. It is worth noting that under either Option 3 or Option 4 ETS-driven afforestation signals could remain the same or even grow stronger relative to emissions reduction incentives. The policy change would simply ensure that such an outcome is the result of intentional government policy, and not an unintended result of crude policy settings (as is currently the case). The implementation of Option 3 or 4 would simply give the government additional tools for climate action, and not determine how much these tools are to be used (if at all).

Federated Farmers Recommends:

- **Option 3 or Option 4 are implemented as a way to give government the tools to moderate the level of impact the emissions trading scheme has on land use decisions. Our preference is for Option 3.**

5. Poor forest management is leading to negative environmental outcomes (such as increased pest and fire risk

5.1. Poorly managed afforestation can create pest and fire risk for rural communities. This risk is heightened where forests are planted purely for carbon reasons as investors are less likely to invest in pest and fire management due to commercial incentives.

5.2. This issue is unlikely to be addressed through emissions trading reform. Federated Farmers recommends that, rather than attempting to address fire and pest risk through changes to emissions trading rules, separate policies are implemented.

5.3. A June 2023 announcement by the Government regarding changes to the NES PF appears to align with such an outcome. Although, at the time of writing details have not been released, we are very encouraged by the media release "Local communities to have a say on farm to forest conversions"[11]

5.4. If the details of this announcement align with our reading of the media release by the Government, we thank the Government for listening to our joint submission with B+LNZ and putting in place solutions to current policy loopholes.[12]

Federated Farmers Recommends:

- **The risk of fire to rural communities from afforestation be better managed, including via legislating for a National Policy Statement (NPS) for Fire Management.**
- **Forestry be bound to nationally consistent 'good neighbour' pest management rules to help prevent the spread of pest species across boundaries with productive farmland.**

Acknowledging the co-benefits of native afforestation and front-loading carbon removals from natives

5.5. Federated Farmers members frequently observe that they face a delima when retiring land from marginal areas. Farmers will observe that a steep hillside or gully planted in natives today will provide higher environmental services in 50 or 100 years time than the same land planted in pine. However, the economic signals sent from the Government steer them towards pine. This creates an dilemma where farmers want to do the right thing, but feel they are leaving huge sums of money on the table, not planting pine in marginal areas.

5.6. This dilemma is captured in Figure 3, taken from within Whanganui farmer Mike Cranstone's property, and Figure 4, showing a nearby Whanganui farm.

5.7. Mike wants to retire the pasture area marked by the red '1'. The area marked by a red '2' shows a similar area retired to pine circa 28 years ago. The pine haven't been thinned and are now falling over. The area marked by a red '3' shows an area of native retirement, which occurred earlier than the pine planting and is now home to a thriving bird population. Mike observes that it would be much better for the environment for him to retire the land near the red '1' to natives, and achieve the outcome observed in area '3', but this will be a net cost to him as carbon credits will not offset the cost of native planting for some time. The current policy settings financially steer him towards planting pine and achieving the outcome displayed in area '2'.

[11] https://www.beehive.govt nz/release/local-communities-have-say-farm-forest-conversions
[12] https://beeflambnz.com/sites/default/files/news-docs/Co-Submission-National-Direction-on-Managing-Afforestation.pdf

Figure 3: Whanganui sheep and beef forest planting

5.8. Figure 4 shows an area of recently harvested pine in amongst land that has naturally regenerated. There is a separate consultation underway regarding carbon accounting for transitioning exotic forestry into indigenous forestry which we will be submitting on. It is observed in Figure 4 however, that by simply planting natives from the outset, there is less damage from sediment and slash at the point of harvest, and there is much greater biodiversity benefit. Assuming that all forest owners who claim they intend to convert NZ ETS pine forestry into natives are genuine, it is hard to see what environmental gains are achieved by going through a pine 'detour' – the biodiversity, soil erosion prevention and sequestration benefits would be higher in year 30 by simply planting native from, the outset.

Figure 4: Comparison between pine and native planting after 28 years

5.9. We note that the Government is currently consulting on a biodiversity credit system. Federated Farmers will submit on this process.

5.10. The NZ ETS should also consider if there are better ways to recognise the long-term benefits of native afforestation and avoid the pine 'detour' that farmers and the environment are put through at present.

5.11. It should be observed that the world is interested in reducing the total stock of carbon in the atmosphere over the next century (Paris Article 4.1). Comparing the carbon removed from two scenarios:

5.11.1. **Pine is planted, then transitioned to natives:** the total carbon stored in the forest is lower after 50 to 100 years, but some additional carbon is removed in harvested wood products. There is risk the transition to natives is not successful.

5.11.2. **Natives are planted from the outset**: the total carbon stored in the forest is higher after 50 to 100 years, however no harvested wood products are generated. Higher biodiversity benefits also eventuate.

5.12. The Government may wish to compare the carbon removed from these two scenarios and ensure that policy is incentivising the scenario that leads to not only the most carbon removal but also long-term broader positive environmental outcomes (such as increased biodiversity, improved water quality and decreased soil erosion).

5.13. A policy option is to 'front-load' the carbon removed from natives, recognising that converting land to natives will generate a long-term carbon removal. Such a policy should take care to avoid perversely recreating the negative socio-economic impacts currently occurring as a result of policies incentivising unsustainable exotic afforestation.

5.14. Such a system could be conditional on the imposition of a covenant such as the QE2 system. This would guarantee that land use is locked in natives and the carbon stock change will occur.

5.15. Such a policy should also take care to encourage sequestration that intergrates into productive farms, rather than bluntly encouraging the afforestation of productive farms.. A 'right tree, right place, right purpose' approach should be at the heart of this policy and not just a talking point.

Federated Farmers Recommends:

- **The Government investigate a policy to 'front load' carbon removals from native planting (treating native planting like a stock rather than flow of carbon) where land owners place a covenant on native planting, recognising that such land use decisions change the long-term 'stock' of carbon in the atmosphere. Such an approach should work with, and not threaten, food production and should take an 'right tree, right place, right purpose' approach.**

6. Risk of investor flight and afforested land abandonment

6.1. Current economic signals for permanent forest planting mean that investors can make large returns from carbon for a period of time but, beyond this, returns will drop to zero. A forest that is no longer removing carbon (and therefore no longer receiving NZUs from the Government) can become a liability rather than an asset if it has ongoing costs such as rates, fire maintenance, pest control and so on.

6.2. This economic condition can result in an incentive for an investor to declare bankruptcy. This scenario concerns many of our members, who fear that rural communities may be home to thousands of hectares of unmanaged, wilding, fire-prone, pest-harbouring pine forests that offer little social, economic or environmental value.

6.3. **Alarmingly,** an investor who has a mature carbon forest that has become a liability can theoretically sell those assets to a company that is willing to structure their operations in such a way they can declare bankruptcy and walk away from the asset. Local communities will be left having to maintain aging carbon forests (potentially paying to transition these forests into native plantings).

6.4. This risk can be avoided by requiring those entering exotic forests into the emissions trading scheme to forgo a portion of carbon units up to a sum of value that will cover the ongoing maintenance of the forest if the investor cannot. Federated Farmers advocate for such a system of bonds in our submission on the 'A Redesigned Permanent Forest NZ ETS Category' discussion paper.

Federated Farmers Recommends:

- **The government implement a system that bonds forest owners to a value that covers the ongoing maintenance of forests**

7. Impacts on global food production

7.1. The Purpose of the Climate Change Response Act is to, amongst other things,

7.1.1. Contribute to the global effort under the Paris Agreement to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels, and

7.1.2. Enable New Zealand to meet its international obligations under the Convention and the Paris Agreement.

7.2. The preamble of any agreement outlines the context to which the agreement should be interpreted; the preamble of the Paris Agreement states '*Recognizing* the fundamental priority of safeguarding food security and ending hunger, and the particular vulnerabilities of food production systems to the adverse impacts of climate change'.

7.3. Article 2 of the Paris Agreement states that the aim of the Agreement is to "strengthen the global response to the threat of climate change, in the context of sustainable

development… including by … [fostering] low greenhouse gas emissions development, in a manner that does not threaten food production."

7.4. This is not occurring in New Zealand. Currently, the NZ ETS is creating an overwhelming incentive to convert land away from food production into a permanent carbon sink. This reduces the global supply of food and increases global food insecurity.

7.5. As land is converted away from pasture to exotic forest there is also the strong likelihood that emissions leakage will occur and global greenhouse gas emissions increase as other countries fill the supply gap left by efficient New Zealand food production.

7.6. Both outcomes contradict the Purpose of the Climate Change Response Act and the Paris Agreement..

7.7. The Government should implement Option 3 or 4, which will provide policy levers to distinguish the incentive sent to reduce gross emissions from the incentive to remove emissions.

Federated Farmers Recommends:

7.8. The Government should remove policy mechanisms that artificially incentivise the afforestation of productive farms. As already mentioned, Federated Farmers has produced a policy document that outlines eight policies that would have such an impact and restore balance.[13]

7.9. One Federated Farmers policy that is particularly important and which looks to have been announced by the Government in its NES-PF media release (with details not released at the time of writing) is that:

"The resource consenting process be amended so that particular land uses are not discriminated against, and all land uses are treated equally as regards to their effects. This would involve exploring the suitability of requiring afforestation of farmland above a certain area or percentage to require a resource consent (in a process like that required for other types of land use change)."[14]

SECTION 2: ANSWERS TO SPECIFIC CONSULTATION QUESTIONS

Chapter 2 Consultation Questions

Q2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

[13] https://fedfarm.org nz/FFPublic/FFPublic/Policy2/National/2022/Policy_Position_on_Government_Policies_Incentivising_the_Afforestation_of_Farmland_.aspx
[14] https://fedfarm.org nz/FFPublic/FFPublic/Policy2/National/2022/Policy_Position_on_Government_Policies_Incentivising_the_Afforestation_of_Farmland_.aspx

Federated Farmers agrees with the discussion document that under current settings, the NZ ETS is likely to drive increased blanket afforestation and, therefore, lower NZU prices as the supply of units is increased.

Q2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

Farmers are eager to use technology and innovation to reduce the emissions footprint of their farming outputs, while also supplying highly sought-after products to growing global markets. However, pricing signals, such as those imposed by the NZ ETS and policies such as the 'Ute Tax' (i.e. clean car fee and clean car standard), have limited effectiveness for our farmers, especially those in remote rural areas. A current lack of commercially available alternatives results in relatively inelastic demand for products such as farm vehicles.

Although many of our international competitors receiving rebates for the increased costs emissions pricing policies have on inputs necessary for farming (eg. fuel and electricity), Federated Farmers supports the NZ ETS as it applies to these farming inputs. However, we strongly oppose policies such as the Ute Tax, which are ineffective, expensive and disproportionately impact farmers and rural people. Farmers and those living in rural areas are being let down by poor roads, an unreliable electricity supply and largely non- existent electric vehicle charging infrastructure. Such policies decrease farmer buy-in for other climate policies and leave farmers with less capital to invest in on-farm initiatives such as upgrading equipment to improve energy efficiency, improving the productivity of on-farm food and fibre production and integrating vegetation on farms to sequester carbon and improve biodiversity.

Farmer support for climate change policies, such as the Ute Tax, will not increase if the policies are inherently unfair and flawed. If the Government wishes to subsidise low-emissions vehicles there are a number of other means (such as NZ ETS revenue) that can be used to fund such a policy. On the other hand, farmer and community support for the NZ ETS can be further improved by redistributing revenue back to New Zealanders via a 'climate dividend'. Such a policy would give every New Zealander a vested financial interest in the continued operation of the NZ ETS and would negate the potential for NZ ETS revenue to be spent wastefully on politically motivated policies that ignore rural New Zealanders.

Farmers and rural New Zealanders need the signal to reduce emissions sent by the NZ ETS to be better complimented by both (1) a regulatory framework that enables innovation and behaviour change to take place (such as in the use of GMOs and emissions inhibitors) and (2) Government investment in necessary infrastructure (such as roads, electricity network infrastructure and electric vehicle charging infrastructure).

2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

See the above example re land owners being incentivised to plant pine in places where native retirement would be more appropriate.

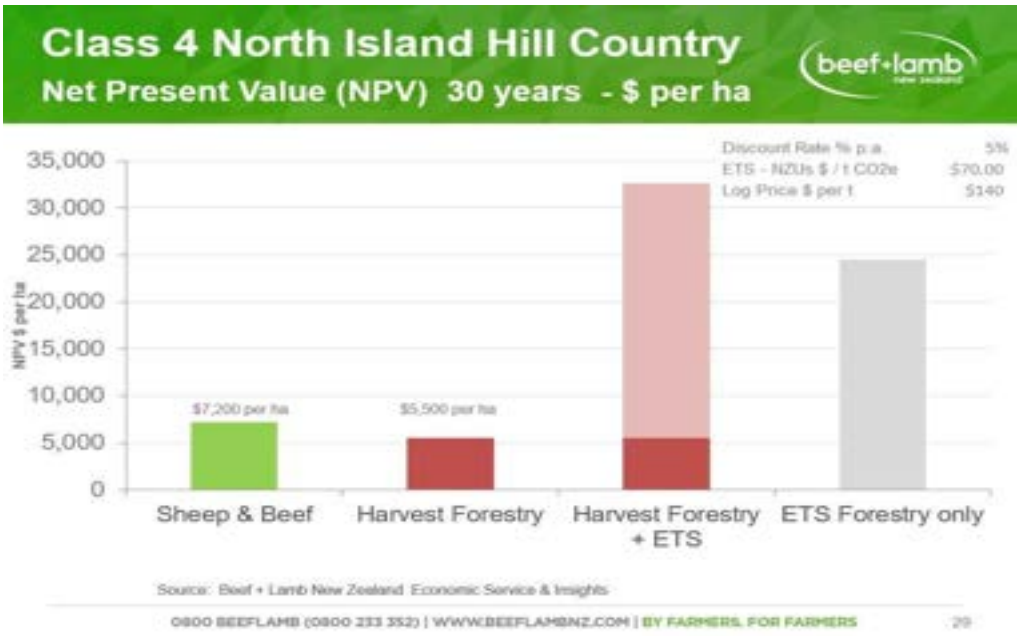
Many farmers have been raising serious concerns about the negative impacts caused by NZ ETS-driven large scale afforestation anecdotally and qualitatively for years.[15] However, a lack of reliable, unbiased and up-to-date government data on large scale afforestation has led to a need for quantitative afforestation data collection and analysis

[15] https://www.50shadesofgreen.co.nz/

to be commissioned by B+LNZ. While B+LNZ should be commended for stepping up and making such data available, this should not be a task requiring funding from a farmer commodity levy organisation. The Government needs to improve its data collection in this area. A 2022 B+LNZ commissioned report paints a worrying picture for the future well-being of many rural New Zealand communities and states:

"According to the latest report from Orme & Associates commissioned by Beef + Lamb New Zealand (B+LNZ), more than 175,000 ha whole-farm purchases of sheep and beef farmland has been sold with the intent to convert into forestry since 2017. This is based on analysis of land sale titles and identification of known forestry interests as the purchaser. More farms could have been sold to forestry interests that were not easily identifiable. The scale and pace of these whole farm purchases is rapidly increasing. In 2017 only 7,000 ha of sheep and beef farmland was sold with the intention to convert into forestry. In 2021 more than 52,000ha was purchased by forestry interests, a 36 percent increase on the previous two years. Carbon only farming (not intended for harvest) is a major driver of the increase in farm sales. In 2020 and 2021, this intended land use was 39 percent of nation-wide farm sales to forestry. The Overseas Investment Office purchase pathways were also a major driver of the whole farm sales, representing 40 percent of the farm area sold to forestry in 2020 and 2021."[16]

The overwhelming impact of the NZU price on the profitability of afforestation has also be made clear by B+LNZ. The below graphic was published in the green paper '*Managing Forestry Land-Use under the influence of Carbon The Issues and Options*' by Yule Alexander Limited and shows the impact of the NZ ETS on the profitability of forestry (both permanent and rotational) relative to sheep and beef farms. The table shows that without the NZ ETS sheep and beef farms closely compete with timber forestry (as is to be expected with two industries that have competed in a largely unsubsidised deregulated market for decades), but with the NZ ETS, forestry (both permanent and rotational) is dramatically more profitable.



Federated Farmers is supportive of the NZ ETS as the most efficient means of achieving a long-term emissions reduction target. However, this support for the NZ

[16] https://beeflambnz.com/sites/default/files/news-docs/Orme-summary-report-2022.pdf

ETS should not be conflated with support for the manner in which forestry is treated under the scheme, with its regressive impacts on rural communities and the lack of measures in place to ensure that the NZ ETS drives the sustainable sequestration of carbon, including the right types of forestry in the right areas for the right reason.

2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

Federated Farmers somewhat agrees with the summary of the impacts of exotic afforestation. The summary concisely outlines the challenges posed, however the risks posed to New Zealand's reputation from relying on monocultural forestry offsets to meet climate targets is not mentioned, and the significant negative impacts on social and economic outcomes in rural communities caused by both carbon only and carbon plus timber blanket afforestation are minimised.

Many other nations and firms are moving away from a policy of accepting simply meeting climate targets, towards a framework that promotes a just transition towards achieving not only climate targets but also other targets, such as those that improve biodiversity, food security and equity outcomes.

Large companies such as Nestle and large jurisdictions such as the European Union have both recently banned the use of offsets to reach climate goals. New Zealand policymakers should not ignore this trend.

Dame Anne Salmond has also publicly warned about the risk posed by New Zealand's overreliance on monocultural blanket exotic aforestation to meet climate goals, writing:

"It is now beyond doubt that New Zealand's primary strategy for tackling climate change - offsetting through the Emissions Trading Scheme, with the financial incentives it gives to the large-scale planting of monocultures of exotic pine trees - runs in the opposite direction to international scientific advice."[17]

Likewise, as shown in the above graphic by B+LNZ, the financial impact of the NZ ETS on afforestation is not limited to carbon-only forestry. It dramatically subsidises the profitability of any forestry entered into the NZ ETS. The sustained employment and flow-on economic impacts of rotational forestry are less than that from pasteral farming, significantly harming the well-being of rural communities. This was made clear in a 2019 report by B+LNZ, which examined the impacts being felt in Wairoa. This report is summarised by B+LNZ as:

"Rural consultancy BakerAg was commissioned by B+LNZ to compare the economic and employment effects of the conversion of sheep and beef farms into forestry.

The report, Social-economic impacts of large scale afforestation on rural communities in the Wairoa District, found that if all the sheep and beef farms in Wairoa were converted to forestry, then Wairoa would see a net loss of nearly 700 local jobs (the equivalent of one in five jobs in Wairoa) and net $23.5 million less spent in the local economy when compared to blanket forestry (excluding harvest year)."[18]

As previously stated, Federated Farmers supports empowering farmers to make their own decisions regarding the best use of their land in open undistorted markets. If booming consumer demand for pine products was driving the recent spike in blanket afforestation, Federated Farmers would not oppose the land use change, even with

[17] https://www.auckland.ac nz/en/news/2022/03/01/ann-salmond-ipcc-report-condemns-forestry-use.html
[18] https://beeflambnz.com/research-afforestation-impacts-wairoa

the poorer economic and employment outcomes that result. However, current afforestation is not being caused by consumer demand for pine timber products, but is instead being driven by poorly planned government NZ ETS settings forcing NZ ETS participants to purchase large amounts of NZUs and enabling 100% of these NZUs to come from forestry offsets.

Chapter 3 Consultation Questions

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

The current policy settings create confusing signals for investors. The Climate Change Response Act has a long-term target of net-zero long-lived gases by 2050, yet Emissions Reduction Plans favour gross reductions. Discussions on the correct balance between net and gross emissions should be driven by the Climate Change Commission's review of the 2050 target. NZ ETS changes can then flow from changes to the 2050 target. This would create a more predictable policy framework for investors.

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

Federated Farmers agrees that a higher emissions price risks resulting in increased global emissions as industries, economic activities and emissions are leaked to less emissions-efficient international competitors and agree that a higher emissions price risks disproportionately and regressively impacting lower socio-economic households and those segments of society with fewer low emissions alternatives available (such as farmers and rural New Zealanders).

We particularly agree with the discussion document when it notes that emissions leakage is a risk for not only industries included in the NZ ETS but also a risk for the agriculture sector as the NZU price leads to the blanket afforestation of emissions-efficient sheep and beef farms that supply highly sought after food to global markets.

Without urgent structural changes to the NZ ETS, higher NZU prices will dramatically increase rates of unsustainable blanket monocultural exotic afforestation.

As previously noted, Federated Farmers' preference for dealing with the regressive impacts of the NZ ETS is to enact a climate dividend.

3.3 How important do you think it is that we maintain incentives for removals? Why?

It is important that there remains an incentive for the sustainable use of carbon removals that occur in a manner that is supported by local communities and in line with broader social, economic, environmental and cultural goals. Incentives for carbon removals should not come at the significant cost of global food security or the wellbeing of rural communities.

Chapter 4 Consultation Questions

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

Federated Farmers agrees with the discussion document when it describes both the importance of climate action and the importance of the forestry industry to Maori. As noted in the discussion document the interests of Maori in this issue are complex, diverse and heterogeneous.

Federated Farmers supports upholding Te Tiriti o Waitangi. We recognise that the Government has a legal responsibility to honour the principles of the Treaty of Waitangi and this responsibility equally applies to New Zealand's climate change and forestry policies.

The NZ ETS-driven spike in blanket afforestation occurring on productive sheep and beef farms is concentrated in rural communities with large Maori populations, such as Gisborne and Wairoa. As productive farms are blanket afforested, year-round pastoral jobs turn into short-term planting, trimming or harvesting jobs or even fewer jobs if the forestry is only for carbon credit 'farming'. Likewise, the flow on social and economic harm such NZ ETS-driven land use change, is causing to rural communities impacts on rural Maori New Zealanders.

Federated Farmers is very concerned at the prospect of a future in which large sections of rural New Zealand are blanketed in fire-prone, pest-harbouring pinus radiata forests that significantly exacerbate storm damage and provide little economic activity, few employment opportunities and a small rating base for councils. Such a future is not in the interests of Maori or any group of New Zealanders.

Federated Farmers acknowledges that there remains a large amount of work to do to address historical injustices incurred by Maori and to improve socio-economic outcomes. Such issues should be addressed directly and appropriately, and a broken forestry settings policy within the NZ ETS should not be used to attempt to compensate for inaction in other areas because of the potential for some Maori landowners to accrue and sell NZUs for large amounts of profit under current NZ ETS settings..

Chapter 5 Consultation Questions

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

Yes, but Federated Farmers wishes to see NZ ETS incentives altered to promote the goal of 'Achieving a Just Transition in line with the Rural Proofing Guidance'. While the Government may wish to prioritise gross emissions reductions over net emissions reductions, as already discussed, rather than having a theoretical preference for differing climate strategies, Federated Farmers is concerned with the tangible and ongoing irreversible harm being done to the wellbeing of rural communities as a result of current NZ ETS policy settings.

Federated Farmers requests that Option 3 or Option 4 be implemented to enable the Government to distinguish incentives for emissions removal and gross emissions reductions. Gross emissions reductions should be prioritised if emissions removals continue to result in overwhelming significant incentives for activities that cause negative social, economic and environmental impacts for rural New Zealand.

If emissions removals result from activities that benefit or have little impact, on the well-being of rural communities (such as through appropriate vegetation or non-biological

carbon sequestration), we see little reason for the Government to reduce incentives. However, the current policy framework in which the Government has no means of distinguishing between the price signal sent to reduce gross emissions from the price signal to blanket afforest productive farmland is unsustainable and should be altered.

Federated Farmers questions why the Government established 'Just Transition' and 'Rural Proofing' frameworks if such policy tools will not be used to inform such a critical review.

5.2 *Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?*

Federated Farmers supports the NZ ETS driving gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities. This issue is complex and will impact all segments of New Zealand society both now and into the future. A policy lens that exclusively focuses on achieving gross emissions reductions 'as quickly as real-world supply constraints allow', is likely to lead to overly simplistic solutions that cause deleterious perverse policy outcomes. Other critical factors need to be considered, such as:

- Avoiding emissions leakage,
- The well-being of rural communities,
- New Zealand's commitment towards achieving all 17 Sustainable Development Goals, and
- Consistency with a climate resilient future New Zealand.

5.3 *Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard- to-abate emissions in the longer term? Why/why not?*

New Zealand's nationally determined targets should not be pursued at any cost; instead should be sensibly set based on the best available science and should be one of many important goals (such as the 17 Sustainable Development Goals) that New Zealand commits to pursuing. .Federated Farmers would like to see a bottom-up approach taken to the removal categories in the NZ ETS that compliments the current top-down approach taken. As previously stated, New Zealand is a global outlier in including the entire forestry sector in the NZ ETS and enabling NZ ETS participants to meet 100% of their surrender obligations with forestry offsets. This extreme policy framework has led to a spike in blanket exotic afforestation, and it is the social, economic, environmental and cultural harm being caused by this spike in afforestation is the core concern of Federated Farmers.

Previous climate change submissions by Federated Farmers outline the ways in which coherence could be bought to domestic targets, international targets and emissions budgets. Still, regardless of the targets chosen, targets should not be pursued regardless of the impact on farmers, global food security and rural communities.

Chapter 6 Consultation Questions

6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

Federated Farmers believes Option 3 represents the best option to achieve climate goals sustainably for farmers and rural communities. Federated Farmers also believes that Option 4 could also be a good option if adequately implemented. How either Option 3 or 4 are implemented will be very important. No matter the option chosen, We encourage the Government to work with farming groups, such as Federated Farmers, to ensure that the unique characteristics of farmers and rural New Zealanders are adequately considered.

In March 2022, Federated Farmers' National Council approved a revised policy on 'Government policies incentivising the blanket afforestation of farmland'.[19] One of the eight policies included in this paper was that *"The Emissions Trading Scheme (ETS) be amended to limit how many forestry units participants can surrender for non-forestry related activities."* This option is most aligned with Option 3 in the discussion document.

Federated Farmers firmly believes that Options 1 and 2 would be devastating for farmers and rural communities and would leave New Zealand even further out of step with international best practice. Further increasing the demand for forestry offsets will likely significantly harm food production, increase global emissions via emissions leakage and likely undermine political support for the NZ ETS overall. Federated Farmers have been calling for action on this issue for years and does not support a 'do nothing' approach.

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

Federated Farmers agree with how the options have been assessed with respect to the key considerations outlined in chapter five.

6.3 Of the four options proposed, which one do you prefer? Why?

Federated Farmers prefers Option 3 as it best enables the government of the day to balance incentives for gross emissions reductions with incentives for sequestration. The settings within this option could be altered in line with circumstances such as the impact on the well-being of rural communities, food production, emissions reduction technology available and the risk of emissions leakage.

As outlined in the discussion document, Option 3 would enable the government to place a limit on the proportion of an NZ ETS surrender obligation that can be met with forestry offsets (as is the case for all other jurisdictions with a meaningful carbon price). A separate limit (or a complete exemption) could be enabled for sequestration activities that generate NZUs without locking up large amounts of productive land and without harming the socio-economic well-being of rural communities.

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19 https://fedfarm.org.nz/FFPublic/FFPublic/Policy2/National/2022/Policy_Position_on_Government_Policies_Incentivising_the_Afforestation_of_Farmland_.aspx

Federated Farmers also supports Option 4. While Federated Farmers supports establishing a climate dividend, some NZ ETS revenue could be used to fund the newly established removal market. Option 4 enables the government of the day to choose how it prioritises removals and to potentially pay a premium for some types of removals while potentially choosing not to purchase removals that result in significant adverse impacts. Option 4 is similar to how other schemes, such as the Oregon Climate Protection Program and the Australian Emissions Reduction Fund, recognise sequestration that meets bespoke holistic criteria.

Under Option 4, carbon removal funds could be allocated by several means, including a reverse auction and negotiated two-party contracts. Along with the amount of sequestered carbon, other factors could be considered, such as biodiversity benefits, impact on food production and water quality benefits.

6.4 Are there any additional options that you believe the review should consider? Why?

No, if combined with the other changes outlined in the March 2022 Forestry policy paper by Federated Farmers, Option 3 or 4 represent the two best options to transition the New Zealand forestry sector to one that supports the long-term prosperity of rural New Zealand.

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

International emissions reduction targets, domestic climate targets and emissions budgets should be amended to ensure that a consistent split gas approach is taken and all emissions are required to make the same contribution to reducing their warming impact. More information on this policy can be found in previous climate change submissions by Federated Farmers.[20]

Federated Farmers requests that all eight policies outlined in the March 2022 policy paper on 'Government policies incentivising the blanket afforestation of farmland' be implemented. While some of these policies have been partially implemented (such as the changes made to the Special Forestry Test), the full implementation of all eight policies is needed to restore balance to land use policy settings.

Chapter 7 Consultation Questions

7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

Federated Farmers believes there is a role for policy to recognise the public good being provided by nature-based ecosystem services. However, deciding how to carry out this goal, and the appropriate allocation of resources is a complicated policy question. In contrast, ruling out activities that harm ecosystem services outcomes should be a more straightforward goal to achieve and would only require ruling out such activities from voluntarily entering the NZ ETS.

Carbon removals that actively and significantly harm other social, economic and environmental outcomes should not qualify for the NZ ETS. It is premature to discuss how to best reward activities that are contributing benefits while current policy settings

[20] https://fedfarm.org nz/FFPublic/Policy2/National/Climate_Change_and_He_Waka_Eke_Noa.aspx?hkey=a94c8947-71c2-43f4-bd41-f2ce4869ed0e

actively promote activities that are significantly harming the same outcomes. The blanket exotic monocultural afforestation of productive farms is an activity that is currently resulting in significant social, economic and environmental harm while being actively rewarded by the NZ ETS.

If the incentives in the NZ ETS are changed to prioritise removals with environmental co-benefits, it should be a fundamental priority that the integrity of the NZ ETS is not undermined. One tonne of carbon should be required to offset one tonne of carbon. Such a principle should be necessary but not sufficient for entry into the NZ ETS; removal projects that are causing widespread social, economic or environmental harm should not qualify for the NZ ETS (such a change is appropriate for a voluntary contract between a land owner and the government and would make the NZ ETS align with other ETS policies globally).[21]

7.2 *If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?*

Options 3 and 4.provide the greatest opportunity for the Governmnt to reward benefits while also maintaining the integrity of the NZ ETS. Options 1 and 2 would be a disaster for rural New Zealand.

7.3 *Should a wider range of removals be included in the NZ ETS? Why/Why not?*

Yes, expanding the number of categories of carbon removals that qualify for the NZ ETS will both help fight climate change and reduce the current overwhelming incentives to blanket afforest productive farmland. New Zealand policymakers should treat international standards and targets as a means of taking climate action and not a goal in and of themselves. If there is strong science that supports the inclusion of a new category into the NZ ETS, its inclusion should be prioritised by the Government.

Additional categories of vegetation that can be integrated into productive farms should be eligible for the NZ ETS in the short term, including small woodlots, shelter belts, riparian plantings and scattered vegetation. More novel biological methods, such as soil carbon and blue carbon, should also be explored with the option for participants to contribute to the cost of verification and authentication if this is prohibitively high for a regulator.

Other non-biological means of removing carbon should also be incorporated into the NZ ETS, such as carbon capture and storage and direct air capture. While unlikely to deliver significant positive ecosystem services when compared to nature-based solutions, such non-biological carbon removal activities are also unlikely to result in severe negative social, economic and environmental impacts currently occurring in rural New Zealand. Additional categories included in the NZ ETS should also be bound by the proposed changes to the NZ ETS, preferably either Option 3 or Option 4 from the discussion document.

7.4 *What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?*

A biodiversity credit scheme funded by NZ ETS revenue could also be an effective means of rewarding co-benefits. Such as scheme should come with strict criteria to

[21] https://beeflambnz.com/news-views/nz-international-outlier-allowing-100-emissions

ensure that it does not significantly harm food production or the well-being of rural communities.

Additional Comments regarding the Agricultural Emissions ETS 'Backstop'

8.1 Federated Farmers would like to use this Review of the ETS as an opportunity to repeat previous requests for the Government to remove the current 'backstop' of bringing agricultural emissions into the ETS at the processor level and with full fungibility between long and short-lived emissions.

In 2022 Federated Farmers described the processor level ETS 'backstop' as a show of poor faith by the Government and one we opposed when it was announced with the 2020 Climate Change Response (Emissions Trading Reform) Amendment Bill and SOP 413. We maintain this view.

Federated Farmers does not support agriculture going into the ETS. The ETS is neither appropriate nor sensible for farmers, rural economies, or the New Zealand economy. Significant policy analysis and modelling undertaken through the He Waka Eke Noa Partnership and the government's own work programmes have shown the detrimental impact of pricing agricultural emissions through the ETS. Ministers have also unambiguously spoken in recent months about the inappropriateness of the ETS for agricultural emissions - yet the flawed backstop legislation remains.

It is highly troubling that the Government continues to propose a processor-level backstop, despite all meaningful stakeholders and the Government itself acknowledging that this is a poor policy. The Government should be more focused on implementing a workable policy that achieves the outlined aims of the already agreed He Waka Eke Noa partnership rather than imposing arbitrary and political timelines and threatening to knowingly enact poor policy if these self-imposed timelines are not met.[22]

The legislated threat of crudely pricing agricultural emissions via the NZ ETS significantly harms farmer well-being, business confidence and investor certainty. The legislative provisions for the 'backstop' should be removed.

ENDS

[22] https://www.dairynz.co.nz/media/5792241/primary-sector-climate-change-commitment-july-2019.pdf

Ngā Pou a Tāne

25 August 2023

Ministry for the Environment

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WELLINGTON 6143

Ministry for Primary Industries

PO Box 2526

WELLINGTON 6140

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Ko au te whenua, ko te whenua ko au.
Ko au te ngahere, ko te ngahere ko au.

Tena Koutou;

RE: Response to the Reviews of Both the Emissions Trading Scheme and the Permanent Category within the Emissions Trading Scheme.

Nga Pou a Tane's response represents over 40,000 Māori across Aotearoa and our response to these proposed changes is summarised as follows:

We are disappointed the Crown continues to work in isolation, without meaningful engagement with us, your Treaty partner. Despite this, we invite the Crown to work with us as both experts in matters forestry and land management, as representatives of Māori, and as kaitiaki of Aotearoa and Papatuanuku.

We see enormous opportunity for Maori and Non-Maori alike in investment into a low carbon emissions economy. However, we find these documents incomplete and without sufficient justification to recommend any changes to the ETS.

We recommend that these proposals be withdrawn, acknowledging ours and many others' feedback, that this is the right thing to do, and look to engage with us to make meaningful and considered change that are consistent with a climate resilient future for our lands, our seas, and our people.

Naku noa, na

Te Kapunga Dewes
Heamana | Chair

Nga Pou a Tane

This is a combined response by Nga Pou a Tane to the Crown's recently released discussion documents and proposals to change the ETS and the permanent category within the ETS.

In addition to our circa 14,000 members, our response also unanimous support from the Tuwharetoa Farm Collective representing 30,405 members (alongside 30,114 hectares). We expect our response to reflect these numbers rather than ask each individual to complete a response as discussed with officials.

In line with our purpose, the focus of our response aligns to this part of the problem statement: "enduring support for emissions removals through [Māori] forestry to contribute to global efforts to address climate change and emissions reductions to 2050 and beyond." However, the roots of our response originate in the indelible relationship our Tipuna created with our Atua, lands, forests, and waters. Passed down to us through whakapapa, blood, and oral histories. Shaping our worldview, providing an alternative to the western extractive, siloed, and industrial ideologies, an integrated and symbiotic relationship with our forest ecosystem.

"Ko te whenua te waiu mo nga uri whakatipu"

Our world was raised out of the sea post the phases of creation Te Kore, Te Pō (the orders of potential) until the warm breath of life from Io Matua Kore, The-Parentless-One spread over this place, and Te Ao Marama came into being. On these isolated islands stable climate and microbes an indigenous organism of plants, flightless birds, insects, bats, trees, fishes, and invertebrates found nowhere else on the globe. Here between Papatuānuku and Ranginui the symbols for understanding our universe, a forest flourished, expired and regenerated itself over and again for millennia.

The ancestors voyaged from islands throughout the Pacific to this place Aotearoa and Rēkohu, led by the ocean currents and seabirds more than thirty-five generations ago. We are deeply rooted, Tangata Whenua people-of-the-land, knowledge holders and keepers of the first law. Mana whakahaere of the tall tree natural forest Tāne Mahuta the infinite biomes and tributaries, regulator, provider, and source of sustenance. We are the many rootlets of forest languages, knowledges, ways of life, customs, and practices. These are our lands.

Our voices remain loud for our mokopuna, those we leave when we are gone.

We are the signatories with the Crown to the Treaty document signed in Waitangi in 1840, which we have used together to lay the foundations of this modern nation New Zealand and we respectfully request our voice be heard.

As the indigenous people of Aotearoa, recognised by the Treaty and described by the many and various policies and regulations including in New Zealand's NDC1, we respectfully request meaningful engagement on the risks and opportunities presented by climate change and specific policies in response. This is to ensure we have full involvement in all phases of policy design, implementation, and evaluation to support agencies to develop a climate resilient future and a just transition for the Crown's partner.

Structure

The structure of our response begins by discussing our concerns with various proposals both in aggregate and in detail. Following, we discuss specific pathways to work in partnership with the Crown to address the challenges we face in creating climate resilient future for our land and our people.

The changes will have significant adverse effects for Māori landowners.

Although "significant adverse effects to Māori landowners" is emphasised in the documents a lack of cultural technical capability informing the overall analysis, and the plans for existing and future carbon removals from Māori land exists in government. The discussion document does not describe the Drivers, Benefits, Trade-offs, and Risks to Māori forest landowners. We reflect different drivers which must be better understood by the analysis and reflected in proposals which aim to lower emissions to avert perverse outcomes. For Māori with marginal farmland especially, the opportunity forces different trade-offs and risks.

This provides evidence the Crown cannot design suitable provisions for Māori forest landowners without our input.

Recommendation 1: This capability gap must be highlighted to the current/incoming Ministers.
Recommendation 2: A codesign partnership towards ETS implementation for Māori forest landowners must be put forward by officials to inform best practice implementation and embed options that work for us, not against us.

The Proposals are Damaging the Forestry Industry in Aotearoa, including Māori!.

The Government's repeated interference in the ETS has resulted in a nose-dive in NZU price, with an underlying message that the Government is very willing to interfere with and undermine our property rights, both into the future AND retrospectively. This has created huge uncertainty for landowner, shareholder, and forestry-related business futures.

This is unacceptable and gives rise to a raft of consequences.

These include the following estimates:

- Treaty Settlement losses:
    - Losses on existing treaty settlements = over $2 Billion (est)
    - Units held in trust on behalf of Treaty Settlement Forests = circa $70 million
- Loss of value of pre-1990 units on hand = $550 million where most are held for Māori P90
- Loss of value to Māori Trusts = Billions
- Loss of value to Māori Forest Owners = Billions

We note that these losses may cause relitigation of Treaty Settlements.

- Loss of value of existing forests = **Billions**
- Loss of value of forests that were planned to be planted = **Billions**
- Loss to taxpayers through auction revenue:
    - $700m of lost ETS auction revenue
    - In Sept: $1 Billion
    - Therefore $1.7 Billion (and climbing) notionally committed to emissions reduction projects now without funding.
- Imported Unit Cost 2030:
    - Additional cost to households of units that would have been grown in Aotearoa New Zealand but now will have to be imported from offshore = Billions
- Loss For The Market
    - Loss of value of units on hand = $6.4 Billion

We accept the government has the responsibility to govern and make legislative and regulatory change aligned to the agreed political ideology of the government of the time. However, this consultation, coupled with the many and ongoing consultation on the ETS has caused potentially irreparable damage to the industry, investor confidence, and the wider economy.

For what purpose? The apparent "need" to have this discussion at this time, so close to an election, where all officials and all politicians can be quoted as saying something akin to "no decisions have been made". Not only is this unlikely albeit technically true, the ability to make a decision based on the outcomes and feedback of this consultation is improbable given an impending election.

In addition, this is the fourth (4th) significant consultation regards the ETS, only 12 months since we were "consulting" on these same topics. Whilst consultation is a significant facet of democratic policy making, the underlying premise is that the consultation is meaningful. This consultation is almost meaningless given timing and lack of evidence-based rigour in assumptions and unjustified modelling. This supports our assessment that this consultation is dominated by a political agenda rather than a realistic attempt to improve Aotearoa's climate resilience nor economic outlook.

Similarly, to others in the forestry industry, we defend our role as foresters and forest landowners subject to the ETS.

Recommendation 3: Immediately withdraw the consultation on Options and leave the ETS to operate on a status quo basis to limit the damage to NZU prices, market confidence, and uncertainty in forestry caused by this consultation – then co-design an a-political and flexible response to the climate challenges we face as we attempt to build and improve our climate resiliency.

Net vs Gross Emissions

It is not the intention of this response to litigate the relative merits of either emissions pathway, it is to provide feedback to government and officials given the position the discussion document reflects in terms of advocating a Gross Emissions focus.

We acknowledge the discussion documents state that both (gross and net) are necessary, and that forest removals are an essential component of this. However, also we recognise the duplicity of the document given it also implies we can't achieve gross emissions reductions when the lowest cost of carbon abatement is forestry removals. This duplicity is further supported by providing only one (1) option (Option 1) that supports the need for significant afforestation to meet these emissions reduction goals.

We agree that both gross and net reductions are necessary and that they can be achieved both concurrently and mutually beneficially. They are not mutually exclusive as is inferred.

We state that the gross vs net position reflected in these proposals are a representation of a political agenda rather than a solution to the climate emergency we (humans) have created. To support this position, we ask the following:

- If we are in global climate emergency, how could Aotearoa ever have too many thriving forests sequestering carbon, purifying water, significantly increasing biodiversity, reducing erosion?
- If gross emissions reductions are so critical, why do the proposals and advice continue to force taxpayers to subsidise the ongoing pollution from the Agriculture industry that represents 50% of Aotearoa's emissions?
- If we must focus on gross emissions, why are all our domestic targets and internationally agreed accounting conventions reflective of Net outcomes?
- The documents assert that a high price carbon price is necessary, and forestry will provide low-cost abatement, so why did the government reject the advice to increase price and in so doing, actually reduce it?

We don't accept that gross emission reductions can't be achieved while the ETS remains in its current form and continues to provide a non-taxpayer funded pathway to economic and environmental wealth for Māori Landowners and the wider economy. This is an academic political agenda being driven by political need not practical solutions.

Potentially our very existence is dependent on decarbonisation of the atmosphere, yet our political agenda is being driven by a concerted campaign of misinformation and protectionism. These affluent and vocal minorities incite fear of change through incendiary statements suggesting:

- Rural communities, jobs, and landscapes are being destroyed by conversion to exotic forestry – carbon or production.
- Aotearoa "feeds the world" therefore it is right we continue to pollute our country.
- The flawed argument of "emissions leakage" asserting that we are the most efficient agricultural producer and therefore world emissions will increase if we decrease.

These mistruths have influenced our political leadership resulting in political failure to construct a deliberate and cohesive pathway to meet our national obligations and avoiding the significant impact of climate change that will be felt acutely by Māori.

Recommendation 4: Create an enabling environment for collaboration with Ngā Pou a Tāne and others (such as Iwi Leaders Climate Forum, Federation of Māori Authorities, Whakapumau, and Te Taumata) to construct meaningful transformational ETS solutions across the Māori spectrum.

Flawed Strategic Modelling Justification

We assert that the modelling provided is strategically flawed to suit an agenda to remove of exotic species from the permanent category of the ETS. **Obviously, we don't agree with the modelling outcomes**, nor do we agree with the political solution of gross emissions focus to the exclusion of removals.

Recommendation 5: Commit to a Māori-government working group that will construct meaningful, interactive, and most importantly realistic modelling scenarios with associated sensitivities for Māori forest (and other) landowners.

The proposal documents go to great lengths to model and conclude that if we allow the ETS to continue to operate as it is currently, we will produce too many carbon units (sequester too much carbon), causing carbon price to go down, and reduce the effectiveness of gross emissions reductions.

If this were true or even likely, we might have responded slightly differently. However, this modelling is filled with assumptive and misleading inaccuracies that have been deliberately directed to support a political and academic ideology – that the ETS is broken, and we must focus on gross emissions as the priority. In short, the model supporting the creation of "surplus" carbon units has been deliberately distorted to reflect a worst-case scenario of outrageously and irrational high supply ex exotic forests, and excessively low demand without any consideration for sources of demand outside current domestic emitters.

It is not the intention of this response to peer review and provide a written critique of the methodology employed although we again stand ready to collaborate with officials and politicians alike to construct meaningful and realistic modelling outcomes. Our concerns with the modelling include:

- The modelling is reflective of an anti-pine sentiment and worst-case scenario, designed to support the political position to focus only on gross emissions reductions.
- It assumes much on the supply side – that landowners in Aotearoa will continue to convert area into forest with:
    - no stated change to incentivisation,
    - irrespective of price reductions in carbon,
    - without consideration to changes in land price,
    - no recognition of projected supply of wood fibre into a circular bioeconomy, and
    - without regard for the special needs required to mitigate the impact of severe climate events.
- It indicates outrageously high supply of forestry removals, while price for carbon is reducing suggesting that landowners and their funders will, without consideration to financial returns, continue to convert ETS eligible land into forest with a reducing carbon price.

- The model reflects the demand as it is today extrapolated into the future without realistic amendments. Which then removes the ability to provide sensitivity analysis to review the impact of:
    - Inclusion of Agriculture
    - International Carbon Trading – import and export.
    - Impact of non-achievement of emissions budgets
    - Secondary domestic and international markets for carbon zero goals.
- There is no economic modelling to the impact on our economy, nor on the just transition implications of any of the options provided.

We would like the opportunity to collaborate with officials and politicians alike to construct meaningful, interactive, and most importantly realistic modelling scenarios with associated sensitivities.

Permanent Category

Aotearoa desperately needs to build climate resilient landscapes. This means more forests.

Some of these will be stereotypical production forests made with short rotation exotic species with the co-benefits attributed to forests generally, coupled with additional economic benefits at clear cut harvest.

Recommendation 6: Use existing levers AND increase incentives for gross emission reductions, AND reduce the expected volume of offshore mitigation, AND improve the removals facility by directing removals towards building climate resilient landscapes.

However, we also need permanent land covering forests as an alternative to clear cut production to provide landscape stabilisation and water ecosystem services including filtration, storage, and reduced migration. We identify these as continuous cover forests (CCF) where harvest is either non-existent, negligible, or with constrained scale such that impact, and footprint is minor. This approach is common in many other countries.

Increasingly the green and conservation movement assert that the permanent category should only consist of native tree species. Unfortunately, this argument is fatally flawed because it fails to appreciate the significant unfavourable economic implications for the landowner, or the taxpayer, or both. If there were a financially feasible and low risk pathway to native afforestation on ETS eligible lands through the suggested changes to the permanent category, we might be swayed to support some of the proposed changes. It does not.

Recommendation 7: CCF to remain in the permanent category, including options for multiple use forestry, exotic continuous cover forestry, exotic continuous cover forestry transitioning to native forest, AND permanent native forest.

We are supportive of a management regime to be applied to this category, and to this end have developed a Code of Practice that we are willing and able to share with officials to help de-risk CCF practices. We do not endorse plant and walk away versions of carbon forestry although we note this type of option has been used to scaremonger the public into believing this is the predominant form of CCF.

Recommendation 8: Abandon the plan to ban exotic species in the permanent category and instead work closely with us, Māori forestry experts, to refine and deliver a framework for continuous cover forestry for this New Zealand ETS category.

In relation to forestry removals, we require an affordable climate change response in which GHG removals are delivered in a manner that:

- Is sufficiently financially viable and has the long-term stability to attract investment and deliver financial returns on that investment.
- Provides rural employment opportunities for Māori.
- Maximises rural economic development for Māori, particularly with respect to economically challenging lands remaining in Maori ownership and those received through the Treaty Settlement Process.
- **Focuses on optionality** so that Māori landowners can make decisions regarding the sustainable development of our land according to our own tikanga.
- Enables a financially viable option to build climate resilient landscapes on erosion prone lands, maximising use of commercial investment to achieve this.
- Helps to encourage transformation in the New Zealand forestry industry towards continuous cover forest systems, with their associated environmental co-benefits.
- Makes the reforestation and regeneration of ngahere financially viable, particularly on land where clear-cut harvesting and/or pastoralism is inappropriate.

In our view, retaining strong incentives for removal activities is of fundamental importance to achieving an effective climate change response, complementing rather than displacing the need for strong gross emissions reductions.

Working in Partnership

Whilst the progressions we articulate following inform a pathway to improved forest ecosystem services, the key principle remains:

We have the skills, knowledge, experience, and perspective that will help transform landscapes and reduce climate impacts for our land and people. Empower us through co-development of integrated approaches to climate resilient architecture (legislation and regulation).

We postulate the government has clearly struggled with engaging the right capability to direct its proposals from the problem statement in respect to the Māori forestry sector. This is an opportunity to work Ngā Pou a Tāne.

Upholding the rights and interests of Māori landowners so we can carry out our responsibilities to our land and people is a legislated requirement of environmental policy in New Zealand. There is a sizable opportunity to do better here and a risk if not. Cabinet and officials must bend the curve and make a concerted effort to work with us not against us - to grasp our culturally indigenous view of the world. This is critical to good governance, climate adaptation, and equitable representation in a 2023 first world nation.

As equally vested Treaty partners in a climate resilient future, there is opportunity to review and better target ETS impact, and for new levers and settings to be innovated so Māori play a critical role as designers and implementers of positive change.

Make space for settings that are specific for our lands. We note one of the "options" suggested this specifically and we applaud this thinking. Unfortunately, the option is not clear and the associated detail insufficient to reach and informed conclusion such we can't support it.

Work with us to ensure national level priorities - like planting fast growing forest (exotics) on Māori and general title land while we innovate new methods for native forest regeneration, transition from pine to native, and establishing and carrying out active management of a range of forests on Māori and general title land.

Invest in a Maximising Forest Carbon Science Plan that builds on mātauranga Māori tikanga informed methods first (not as an add on) for the rapid acceleration of new carbon native forests that value tangata whenua rights and interests with taonga species and ngahere Māori-mauri.

We do not agree with the way the science plan is currently written. It seems to completely ignore the Vision Mātauranga policy which is an underpinning plank of the New Zealand science and innovation ecosystem and Te Ara Paerangi pathways. It does not bring to the fore Māori rights and interests and ngā taonga tuku iho in science especially as it may relate to Māori genomic materials and methods. Work with Ngā Pou a Tāne forest research specialists to improve this.

Further develop industry transformation plans that innovate a marketplace for multiple kaupapa multi-purposed poly-cultural forestry and wood processing infrastructure. Work with the Ngā Pou a Tāne's ITP experts to improve this.

The ETS must empower a Māori forestry paradigm for permanent forests. This approach on Māori-owned land, but equally applicable on non-Māori land, meets the broader stable goals. However, it needs to prioritise meaningful codesign, engagement and leadership from the Māori forestry sector. This paradigm should not be limited as it builds onto a culturally indigenous Māori worldview of forests, and it must be subject to the higher standard of Māori (tikanga informed) policy.

Māori Forestry Paradigm and ETS Design

Right ngahere, right whenua, right kaupapa.

Ngahere is a whole system including its impacts (not a tree).

Kaupapa infers a longer-term strategic intent, by collaborative partners, under a Māori conceptual framework of Tāne-te-Waiora Tāne -te-wānanga Tāne nui-a-rangi, that may include many activities carried out together, for a broader set of outcomes that are valued by all beneficiaries to the created ecosystem.

Whenua means more than place – it carries spiritual meaning and incapsulates whakapapa, honouring customary relationship between neighbours and the environment, layers of history, and appropriate localised decision making which may include the decision not to plant exotics on fragile land or not.

And a preference for flexible optionality from permanent, and production to multi-purpose forests. Forest additionality that include but are not limited to native forests, achieving balance between people and place for climate resilience.

Recommendation 9: Ministry for the Environment, and the Ministry for Primary Industries work with us and position Ngā Pou a Tāne at a national policy level as our representatives - to work together on a just transition in the following ways:

- Coordinate and prioritise impact for Māori through an active working partnership to rapidly design targeted outcomes in the ETS – for historical and future stocks of carbon on Māori land through Māori forests, Māori forestry value chains, and Māori integrated and diversified land use.
- Link ETS options to enhance (not disable) existing and still emerging self-determining pathways for working-forests and permanent-forests such as those in the Forestry & Wood Processing Industry Transformation Plan.
- Complete Māori cultural impact assessments and put in place risk mitigation on the research aims being suggested in the Maximising Forest Carbon Science Plan.
- Meet and discuss implementation of our Permanent Forest Code of Practice as a regulatory requirement in New Zealand.

APPENDIX 1: NGA POU A TANE'S RESPONSE TO CONSULTATION QUESTIONS

Question 2.1: Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

No. This assessment has been developed to gain support for, and to fulfill, a political agenda for changes to Aotearoa's approach to climate change action. Specifically, it seeks to shift from net emission to prioritising gross emissions. While perhaps well-intentioned, this revised approach does not have any mandate from Parliament and is contrary to what it set out in the current legislation. More broadly, it has not been consulted on or endorsed by political parties, Māori, key stakeholders, and the public. This can be contrasted from the focus on net emissions, which is captured by the current legislation, and which was broadly consulted on and endorsed when that legislation was passed. The conclusions set out in this chapter are not valid or supported by evidence.

Question 2.2: Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

Nil response

Question 2.3: Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

Afforestation of Maori owned land made possible by carbon investment is significant. Whilst we don't have statistics to support this assertion, anecdotal evidence from our membership and associated parties indicates an increasing demand for this opportunity. From our "unsophisticated" landowner groups, this is the only pathway to native afforestation (via transitional forests) despite the arguments presented by native centric groups such as Pure Advantage, Dame Anne Salmond, and the like.

Question 2.4: Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

No.

Whilst we are completely aligned to the concept of recloaking the whenua in native, that does not mean all other options are to be excluded. Currently the only feasible pathway to native afforestation for the majority of Maori is via exotic afforestation. Notwithstanding this, in a climate and biodiversity emergency, any forest of any sort is of more value than pasture, and it must be remembered that we are only talking about afforestation of pasture enabled by the ETS – not changing other ineligible land uses.

Question 3.1: Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

No. It is not an 'either or'. Rather, <u>both</u> net and gross emissions reductions must be incentivised. Please refer to the body of the document for further information.

Question 3.2: Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

No. We will not go quietly into the night and allow Māori to bear the disproportional costs that will be imposed on our people. We require much better economic and social strategic planning and supporting evidence to create an acceptable pathway and we stand ready to assist the Crown in part through the work we have in progress around a National Maori Forestry Strategy.

Question 3.3: How important do you think it is that we maintain incentives for removals? Why?

Until a viable and beneficial alternative option is constructed, it is vitally important that there are incentives for removals, and that forest investment is supported.

Question 4.1: Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

No. The description demonstrates lack of understanding of Māori and our aspirations. We have explained this many times over the last 24 months to Ministers and officials alike. Despite this, we remain willing and able to work with the Crown to improve understanding and co-design climate resilient landscapes and people.

Question 4.2: What other interests do you think are important? What has been missed?

Working with Maori and subject matter experts to develop viable and realistic solutions.

Question 4.3: How should these interests be balanced against one another or prioritised, or both?

It is for Māori to decide what is right for Maori.

Question 4.4: What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

Based on an earlier RIS, at a minimum the opportunity is $16B. Whilst not all of this will be realised, that is the minimum scale of the opportunity lost if the Crowns proposals are progressed.

Question 5.1: Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

No. Please refer to the body of the document for further information.

Question 5.2: Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

Possibly, but not without adequate understanding of the implications. We cannot afford for the economic and social costs of scarcity to be imposed on our people, particularly in circumstances where the Government does not know the extent of those costs.

Question 5.3: Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

Yes. The importance and benefits of forestry removals to helping meet Aotearoa's climate change goals are well established.

Question 5.4: Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

No.

Question 5.5: Are there any additional criteria or considerations that should be taken into account?

Nil response.

Question 6.1: Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

We support only the status quo. Whilst some options may have merit, there is insufficient supporting information to make an informed choice against these selection options. Furthermore, there are options that are not discussed at all that we would prosecute if provided an opportunity to do so in the co-design phase.

Question 6.2: Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

No.

Question 6.3: Of the four options proposed, which one do you prefer? Why?

None.

Question 6.4: Are there any additional options that you believe the review should consider? Why?

Yes. These can be discussed during the co-design phase.

Question 6.5: Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

Nil response.

Question 6.6: Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

No.

Question 7.1: Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

The documents seem to suggest rewarding other forms of carbon removal and providing incentives for co- benefits. However, no numbers are provided, and details are vague. That said, it appears this would be a state-run process presumably planned to be funded by the arbitrage stolen from Māori landowners and other foresters investing in planting under the proposed nationalisation system, if any planting occurs. Obviously, this is hugely concerning for us if this is the case.

Question 7.2: If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

See above.

Question 7.3: Should a wider range of removals be included in the NZ ETS? Why/Why not?

See above.

Question 7.4: What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

See above.

APPENDIX 2: NGA POU A TANE'S RESPONSE TO CONSULTATION QUESTIONS - A REDESIGNED PERMANENT FORESTRY CATEGORY

Question 1: How do you think the Inquiry's recommendations could be reflected in proposals to redesign the permanent forest category?

It is unclear why the Inquiry's findings might be reflected in any permanent category redesign because this was in reality directed at production forestry. We accept the TOR included other land use but that was not what the inquiry ultimately focused on.

Question 2: Do you agree with our assessment criteria for the redesigned permanent forest category? If not, what would you change and why?

No. We have consistently and repeatedly debunked the rationale for this progression, yet it appears to fall on deaf ears. The rationale for change is fatally flawed in that it is politically driven through lobbying pressure from affluent minority groups.

Our recommendation is to re-introduce the stock change system in the ETS to replace this category.

Question 3: Do you think any of these criteria are more important than the others? If so, which criteria and why?

Not applicable based on our positioning.

Design Choice 1: Which forests should be allowed into the permanent forest category?

The status quo should continue.

Question 4: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? Note, options 1.2a and 1.2b are not mutually exclusive.

We support the status quo only.

Question 5: If you support allowing exotic species under limited circumstances, how do you think your preferred 'limited circumstance' should be defined? For example, if you support allowing long-lived exotics to register, how do you think we should define 'long-lived'?

See response to question 4.

Question 6: Do you think there is an opportunity to use permanent forests to stabilise erosion-prone land?

Yes. Permanent forests already provide this ecosystem service, without monetary recognition currently!

Question 7: Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?

No, we support the status quo and active management. Our proposed Code of Practice will address this.

Design Choice 2: How should transition forests be managed to ensure they transition and reduce the financial risks to participants?

Yes. Transition forestry requires active management by the landowner.

Question 8: Do you agree with the proposal for a specific carbon accounting method for transition forests? If you disagree could you please provide the reasons why?

No, other than the replacement or re-introduction of the stock change system.

If there are other options you think we should consider please list them.

Stock Change.

Question 9: If you agree with the proposal for a specific carbon accounting method for transition forests, what do you think it needs to achieve?

We don't agree.

Question 10: What do you think should occur if a forest does not transition from a predominately exotic to indigenous forest within 50 years?

The question is misleading. What difference does it make if it takes 50 – 100 – or a 1000 years? If the question is about carbon earning in the ETS. This is a completely different question.

If a forest doesn't transition in accordance with a management plan (including financing arrangements) there are mechanisms already built into the ETS to address this. These mechanisms could be improved to suit exotic to native transition forest outcomes.

Question 11: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? Note, options 3.2 and 3.3 are not mutually exclusive.

We claim the right to manage our own lands and decisions on them. It is time for the Crown to stop telling us what we "should" do, and let us make those decisions.

Question 12: If there were to be additional management requirements for transition forests, what do you think they should be for? Why?

See question 10.

Question 13: Do you think transition forests should be required to meet specific timebound milestones to demonstrate they are on a pathway to successful transition?

See the answers to question 10 and 11 above.

Question 14: Do you agree with this proposal to allow transition forests to be permitted to clear-fell small coupes or strips to establish indigenous species? Why? And if you agree, what other restrictions should there be?

Provided the existing criteria in the ETS is met, we see no need to impose further rules nor regulation.

Question 15: If forest management requirements are implemented, do you think these should be prescriptive or outcomes-focused? Why/why not?

We don't support the construct of any management requirements without our input in co-design.

Question 16: What are your views on forest management plans?

We don't support the construct of any management requirements without our input in co-design.

Question 17: What should forest management plans include?

We have repeatedly offered to work with officials on a Code of Practice that we have constructed with input from industry and Māori alike. We want to collaborate on this issue in the new term of government.

Question 18: Who do you think should be allowed to verify and/or monitor forest management plans?

An independent expert who is recognised as qualified to do so.

Question 19: How often do you think forest management plans should be re-verified?

This is dependent on the agreed level of management required by any management plan. Given none is provided, it is impossible to respond.

Question 20: What do you think should happen if there are not enough people to verify forest management plans?

Train more or pay more.

Question 21: Do you think the use of existing compliance tools are appropriate?

Nil response, it is unclear why this question is necessary.

Question 22: Do you think there should be new or expanded compliance tools for permanent forests? Which ones and why?

No. See the answer to question 21 above.

Question 23: Are there other compliance options that you think we should consider?

No. See the answer to question 21 above.

Question 24: For the compliance tools you think we should have, when do you think they should be used?

Not applicable

New Zealand **Carbon Farming**

Review of the New Zealand Emissions Trading Scheme

25 August 2023

Submission to:
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PO Box 10362
WELLINGTON 6143

Ministry for Primary Industries
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SUBMISSION SUMMARY FOR THE MINISTER

In order to ensure NZCF's position is captured properly and fully, we have prepared a one paragraph summary that should be copied directly into the briefing document provided to Ministers[1]*:*

Having caused major damage to investor confidence and land values, and harmed Aotearoa New Zealand's progress on climate change through its release, this review has also failed to make a case for change, relying as it does on insufficient and erroneous data and assumptions. It should be withdrawn, and a new, collaborative and fair approach taken which preserves the status quo of the ETS and enhances participation from local landowners, stakeholders and Māori. The key argument for change – the assertion that there will be an oversupply of NZUs by the 2030s – has been widely debunked by expert, real-world analysis from the sector. Thorough examination of the underlying modelling on which this assertion has been based – once it was finally released – has further reinforced there is no basis for the options proposed. More broadly, the proposals seek to make a fundamental shift in Aotearoa New Zealand's climate strategy. They are part of an ideologically-driven agenda to move the measure of performance from net emissions reductions, as legislated, to gross emissions – an approach that has not been endorsed by Parliament. To date, the impact of this review has been catastrophic, not only for the forestry sector and those who hold NZUs, but also for the achievement of our net emission targets. Prices have dropped, investment funding has chilled and there is significant uncertainty across the sector. The Minister's failure to give assurances on the issue of grandfathering has been particularly concerning. This shows not only poor legislative practice but also risks setting a dangerous precedent across all classes of land and asset ownership and investment. Taken as a whole, these proposals are seeking rapid decarbonisation of the whole economy driven by state control – essentially a nationalisation of the ETS. The impacts – as noted in the consultation document – include fuel scarcity and electricity shortages, as well as an unacceptable burden on communities through predicted job and business losses. The options will all result in the destruction of private investment and the undermining of existing agreements. This will further harm confidence in the market, incentives for private participation and New Zealand's status as a first world nation with a stable investment framework.What is clearly missing from these proposals is a pathway that represents the fairest, lowest cost and most equitable approach to decarbonising the economy. Where that pathway exists is in maintaining the status quo. Despite the claims made in the review, now that the regulatory-led measures which have weakened the ETS over the past decade have been removed, the ETS is performing as it should. Net and gross emissions are reducing, and the private sector is – or was – investing in Aotearoa New Zealand's climate action. Given there is no merit in the central rationale for this proposal – the risk of oversupply – and the social and economic costs of the options are simply too great for the country, this review must be completely withdrawn. Work needs to start again, in collaboration with investors, stakeholders and Māori, to develop an approach which rather than seeking to destroy the working ETS, challenges barriers for participation and establishes a fair and equitable carbon transition for the good of all Aotearoa New Zealand.

EXECUTIVE SUMMARY

1. New Zealand Carbon Farming Group (**NZCF**) strongly believes that the Government must immediately withdraw the *Review of the New Zealand Emissions Trading Scheme* (the **Discussion Document**)[2] and leave the ETS to operate on a status quo basis. The Discussion Document is causing serious market uncertainty and undermining confidence in the ETS. Every moment that this uncertainty remains, the damage is compounding, making the road to recovery longer, more difficult, and more expensive.

2. We encourage the Government to use the existing mechanisms in the ETS to help meet Aotearoa New Zealand's climate change targets. When left to operate as intended, the ETS was

[1] We are aware that officials have committed to other parties that paragraph summary statements will be included directly into briefing documents, and wish to ensure that NZCF's submission is treated in the same manner.

[2] Ministry for the Environment, Ministry for Primary Industries and Ministry of Business, Innovation & Employment. 2023. *Review of the New Zealand Emissions Trading Scheme: Discussion document*. Wellington: Ministry for the Environment [***Discussion Document***].

successfully encouraging forestry removals while maintaining a steadily increasing NZU price which acted to encourage emissions mitigation and reductions.[3]

3. The proposals contained in the Discussion Document should be abandoned, as they do not support the stated objectives and they will irrevocably damage Aotearoa New Zealand's ability to meet its climate change targets.

4. **Leave the ETS alone – it works:** When left to operate as designed, the ETS has been performing as intended. There is no market failure. Emissions have reduced, removals have increased, and Aotearoa New Zealand was on track to meet its climate change targets. Emitters were starting to act while the ETS was stable. All perceived issues with the ETS can be directly attributed to the Government's failure to use existing mechanisms in the ETS in line with Climate Change Commission advice and the continued regulatory interference by the Government. This consultation seems more focused on Government control of the ETS, than on improving it. Due to the substantial uncertainty caused by this consultation and other Government decisions, there is a risk that investors will lose confidence in the ETS.

5. **Forests are critically important:** For years, the Government and Climate Change Commission have been consistent that, without more forests, Aotearoa New Zealand cannot meet its climate targets. There are 35 separate references to the importance of forestry in the Discussion Document,[4] primarily by removing emissions, while acknowledging numerous co-benefits for our country, including employment, economic returns for land owners and the country, erosion control, and enhancing biodiversity.[5] However, the proposals actively discourage forestry and, if adopted, will result in irreparable harm to the forestry industry (with downstream impacts on communities and other industries) and substantially reduced emissions removal activities for years to come.

6. **There is no NZU oversupply, and so no case for change:** One of the key justifications for the proposals in the Discussion Document is that high levels of afforestation will result in an "oversupply" of NZUs in the ETS, which will lead to reducing NZU prices which in turn will not sufficiently incentivise emitters to reduce their emissions. We completely disagree that there will be an NZU oversupply, so there is no case for changing the ETS. How can there simultaneously be an oversupply of NZU's, and a Government expectation that Aotearoa New Zealand will fail to meet net-zero by 2050 such that the Government plans to spend billions of dollars to buy offshore carbon credits to make up the difference? It simply does not make any sense.

    - The Discussion Document relies heavily on flawed and unsubstantiated modelling which was designed by officials to support the proposals, but upon scrutiny that "modelling" simply does not support a conclusion of detrimental oversupply.

    - We have reviewed the modelling (alongside others) and have concluded that they are not robust and contain a number of significant errors and assumptions. Forecast demand has been set at an unrealistically low level ignoring key sources of demand, while supply from forestry/afforestation has been forecast to reach and sustain record levels for more than 25 years.

[3] See paras 22 -24 and 31-32 below and sources quoted in those paras.
[4] *Discussion Document*, above n 1, at page 6, 7, 8, 10, 14, 16, 19, 20, 22, 23, 24, 29, 41, 42, 46-47, 51, 69, 70.
[5] *Discussion Document*, above n 1, at 10 and 20

- NZCF commissioned a PwC report to assess the Government modelling, and that report supports our conclusions[6].

7. **This consultation is causing irreparable damage to the forestry industry and wider economy:** The Government's repeated interference in the ETS and regulatory reform has created massive uncertainty and has seriously unsettled the market. Publication of the Discussion Document resulted in a plummeting NZU price. The message being given to investors is that the Government is willing to interfere with, and undermine, property rights, including extracting value from private investments. Forest industry leaders have publicly announced that new forest investments have ceased, and no new planting will occur (other than in some very limited cases due to existing commitments, likely about 10,000 ha). Jobs will be lost in the regions as a result, adding more cost to future taxpayers. The ETS has stopped functioning. Government revenue is down $700 million (and will fall further). A substantial drop in forestry removals will leave the Government with no other option than to purchase more overseas credits (at greater cost) to meet our NDC.

8. **The impact of this consultation on Māori is significant in terms of loss of wealth and self-determination:** The proposals have already wiped billions of dollars off the balance sheets of Māori land trusts and organisation's existing investments in planting fast growing exotics on their lands. This policy denies Māori their Te Tiriti o Waitangi rights to determine what they can do on their tribal lands[7]. For Māori, participation in the carbon economy was a once in a generation opportunity. The opportunity cost of this policy for the Māori economy is estimated to be a loss of $16 billion.

9. **Aotearoa New Zealand needs to meet its own climate change targets within Aotearoa New Zealand, not by buying imported carbon credits:** The Government's proposals will result in significantly reduced forestry participation in the ETS, meaning substantially reduced forestry removals. This means the Government will need to buy offshore carbon credits to meet Aotearoa New Zealand's emission reduction targets. It is estimated that Aotearoa New Zealand will need to spend an additional $2 billion on offshore carbon credits, which will cost taxpayers as much as $2,800 per person just to meet Aotearoa New Zealand's 2030 international obligations. Unless the consultation is withdrawn, this cost will be repeated the decade after also, as forestry investment has ceased because of the proposals contained in the Discussion Document.

10. **The Government must urgently and unequivocally state that it will not impose regulatory changes on existing forestry and NZU investments**: Several of the Government's proposals would have retrospective effect and undermine property rights, including reducing NZU entitlements in existing forests, cancelling existing NZUs by imposing new expiry dates and restricting how existing NZUs can be used and who they can be transferred to. Such proposals will have a material adverse impact on existing asset values, property rights and business contracts and other arrangements. They effectively punish existing forestry ETS participants for having invested in climate action. If the Government fails to give unequivocal assurances that the proposed changes will not apply to existing forests and existing NZUs, this will have a serious and chilling effect on investment throughout Aotearoa New Zealand in all sectors, because any investor in Aotearoa New Zealand must have serious concerns that a government would change the law to intentionally undermine existing investments made in good faith.[8] This is already

[6] *PWC; Review of Emissions Trading Scheme unit forecast supply-demand balance analysis; A report for NZ Carbon Farming; May 2023.*
[7] This has been described by Māori stakeholders as akin to the foreshore and seabed issue.
[8] This is explained further at paragraph 97.

being seen with a crash in NZU prices and industry wide statements about a freeze on new forest investments and forest planting. Our legal advice is that law changes should not have retrospective effect. Legislation should also respect property rights. We are frankly astounded that the Discussion Document was published containing proposals which so clearly do not meet the legislative standards of Aotearoa New Zealand (or any developed democracy for that matter).

11. **Flawed Consultation:** While it is reasonable for the Government to review the ETS, the lack of prior engagement with Māori and the industry, the nature of the proposals put forward in this consultation, and the lack of transparency in underlying modelling, have severely undermined the legitimacy of the consultation. Furthermore, the Discussion Document is only the most recent in a long line of consultations which move the ETS goal posts yet again. Since 2002, the Climate Change Response Act 2002 has been amended more than 30 times and the ETS has been the subject of four major reviews. In that same time, a Pinus radiata forest planted in 2002 has not yet reached harvest age. Forestry is a long-term investment. Investors need regulatory certainty and consistency – they need to know that if they plant a forest today, they understand the fundamental rights and obligations they will have over the life of that forest. Given the level of regulatory interference, it is little wonder that investment in forestry has stalled.

12. This Discussion Document has two objectives: (a) encourage emissions reductions; and (b) continuing to support removals. The proposals contained in the Discussion Document fail on both fronts. The Discussion Document has crashed the NZU price (the opposite of the Government's intention) making emissions cheaper, which discourages investment in reduction initiatives, and the proposals actively discourage forestry activity. If the Government wants an effective and efficient ETS that supports removals and increases the NZU price (thus disincentivizing emissions), it must allow the ETS to function as intended.

ABOUT NEW ZEALAND CARBON FARMING

13. First established in 2010, NZCF has grown to the point where it is one of the largest contributors to Aotearoa New Zealand's climate change endeavours.

14. We firmly believe in the ethos of the right tree for the right place. The organisation actively manages its nationwide, conservation-focused estate transitioning from exotics to indigenous species. It does this through an actively managed, science-based transition process that recreates complex bio-diverse ecologies in locations where they once featured so prominently. Today our forests store one tonne of carbon every 13 seconds, and the total stored now exceeds 28 million tonnes.

15. Over 95% of NZCF's 85+ million trees are planted on low-productivity, marginal land (Land Use Class 6 - 8) that is usually remote, steep and often erosion-prone. We plant our forests in carefully selected locations, with appropriate conditions, as a crucial nursery canopy for a transitioning indigenous understorey that, with proper active management and long-term resourcing, over time becomes a healthy, sustainable, complex native forest.

16. The company works with over 6000 partner landowners, farmers, and with Māori / iwi enterprises. Those partnerships have returned more than $105 million to the rural sector.

17. We are primarily an Aotearoa New Zealand owned and operated company. We are a significant participant in the ETS, providing high quality domestically grown carbon credits.

18. We work with both the forestry and the emitter sectors and have partnerships in place with Iwi forestry groups. In terms of our leases, we actively encourage and fund a change in land use to permanent regenerating forestry, if the landowner's circumstances support this.

19. Using the income derived from carbon capture, NZCF is able to reinvest in more planting and meet the considerable annual costs of actively managing the regeneration of our permanent forest estate.

20. As an organisation, we've managed the sequestration of over 28 million tonnes of CO2, that's more than all of Aotearoa New Zealand's annual transport emissions. In light of our role in the forestry ETS, NZCF is well placed to comment on the operation of forestry ETS in Aotearoa New Zealand.

LEAVE THE ETS ALONE – IT WORKS

21. **Summary:** When left to operate as designed, the ETS has been performing as intended. There is no market failure. Emissions have reduced, removals have increased, and Aotearoa New Zealand was on track to meet its climate change targets. Emitters were starting to act while the ETS was stable. All perceived issues with the ETS can be directly attributed to the Government's failure to utilise existing mechanisms in the ETS in line with Climate Change Commission advice and the continued regulatory interference by the Government. Due to the substantial uncertainty caused by this consultation and other Government decisions, there is a real risk that investors will lose confidence in the ETS.

22. The ETS has been working (i.e., until recent regulatory interference). A recent Stuff article from 20 July 2023[9] quotes Statistics NZ data that emissions have dropped 9% in 3 years. The article cites various examples of emitters reducing their emissions, including cuts at metal making factories, overall manufacturing emissions dropping and green electricity. There are numerous public examples which we anticipate will be covered by other submitters, but, as a small sample only, include:

    - Contact Energy plans to be net zero by 2035 and between investment in renewables and closure of some gas stations it has reduced emissions since 2012 by over 60% or 1.4 million tonnes p.a.;
    - Methanex investment in distillation columns reducing emissions by 50,000tpa;
    - Four power companies (Mercury, Contact, Ngawha, Eastland) have committed to trials of geothermal carbon reinjection and sequestration technology that could reduce geothermal emissions by 568,000tpa; and
    - Golden Bay cement now substitutes 50% of the coal in its Whangarei plant with used tyres and construction waste.

23. In July 2023, Statistics NZ reported a 1.8% fall in Aotearoa New Zealand's emissions for the December 22 quarter.[10]

[9] https://www.stuff.co.nz/environment/climate-news/132583115/from-a-high-in-2019-emissions-have-fallen-for-three-straight-years
[10] https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-industry-and-household-december-2022-quarter/#:~:text=From%20the%20September%202022%20quarter,down%201.1%20percent%20(21%20kt)

24. Statistics NZ said MBIE statistics showed "that the share of renewable energy sources increased to 94.7 percent in December 2022, a level not seen in decades, with a historically low proportion of gas and coal being used to generate electricity." This is an indication of a functioning ETS.

25. At the same time, removals have been increasing as a result of afforestation. These forests are providing jobs and investment opportunities in regional Aotearoa New Zealand and funds to invest in further emissions reduction activities. Aotearoa New Zealand is in the fortunate position to be able to use forestry to transition to lower gross emissions over time in a manner that gives emitters time to find a way to reduce their emissions. It is very easy for politicians to say that emitters must cut their gross emissions – but doing so may not be easy, requiring different combinations of capital investment, legislative change, Commerce Commission approvals, time, and technology.

26. The Discussion Document's underlying concern is that the ETS must sustain a strong, stable, and gradually increasing NZU price to support emissions reductions.[11] The higher the NZU price, the more incentivised emitters will be to invest in low-emissions technology, energy efficiency measures, and other abatement opportunities.

27. NZCF supports these underlying objectives. A strong stable NZU price will stimulate investment in research and development into low-emissions technology, reduce emissions by emitters, encourage removals, and ultimately assist Aotearoa New Zealand in reaching its climate change goals. Further, a strong NZU price supports Aotearoa New Zealand employment and business, not just for groups like NZCF, but nurseries, contractors, landowners, and forest management groups.

28. Therefore, the status quo must be preserved. We believe the best way to support the ETS is to let it function as intended, utilise existing levers in the scheme, and allow forestry participants to operate without constant regulatory reform and Government interference.

29. Up until November 2022, the ETS was performing as intended. Forestry participants were effectively and efficiently removing carbon from the atmosphere, free from any taxpayer investment or government funding. Forestry was functioning as envisioned in the ETS and performing its role as the major contributor to Aotearoa New Zealand's ability to reach our climate change targets.

30. Further, and to the Government's underlying point, over the past few years, until December 2022, the NZU price had steadily increased to a point where it was starting to stimulate emissions reductions investment and removals. Importantly, the market had come to expect that elevated prices would continue to be supported, and would not be undermined by government intervention, providing the necessary support for long term investments in reductions and removals. This also reflects the Discussion Document's desired "price stability," necessary to provide businesses and individuals with the certainty they need to make investments that reduce emissions.[12]

31. Unfortunately, the certainty that NZU prices would not be undermined came to an end in December 2022, when the Government rejected the Climate Change Commission's recommended auction settings without supporting evidence. This was further exacerbated in the following months as both the Climate Change Commission and Government made public their intention to consider a wholesale review of the NZ ETS. Due to these actions, NZU prices

[11] *Discussion Document*, above n 1, at 33.
[12] *Discussion Document*, above n 1, at 33.

dropped from a peak of $88.50 in November 2022, to $54 by March 2023 then a low of $34 in July.

32. The ETS has been the subject of repeated and increasingly hostile interference. With each announcement, consultation, and auction, all driven by the Government, the NZU price falls. The biggest hit to the NZU price occurred on publication of the Discussion Document, which saw the NZU prices drop precipitously to a low of $34 per unit in July 2023. If the Government wishes to return to that stable NZU price of late 2022, it needs to replicate the conditions of stability – let the ETS and forestry function as intended, cease all unnecessary interventions and reject any further considerations of ETS reform.

33. To quote Dr Rod Carr: "Confidence in the stability and predictability of the NZ ETS is key to making it effective."[13]

34. NZCF supports both emissions reductions and increased removals, provided steps to reduce emissions do not undermine options for landowners and foresters. These objectives are not mutually exclusive and should not be treated as such. The options presented do not achieve these underlying goals and if the Government proceeds despite our warnings and recommendations they are setting Aotearoa New Zealand up for failure.

FORESTS ARE CRITICALLY IMPORTANT

35. **Summary:** For years, the Government and Climate Change Commission have been consistent that, without more forests, Aotearoa New Zealand cannot meet its climate targets. This is reflected in the Discussion Document which contains 35 separate references to the importance of forestry in the ETS,[14] primarily by removing emissions, while acknowledging numerous co-benefits for our country, including employment, economic returns for land owners and the country, erosion control, and enhancing biodiversity.[15] However, other than the status quo, the proposals actively discourage forestry investment and, if adopted, will result in irreparable harm to the entire forestry industry (with downstream impacts on communities and other industries) and permanently reduced emissions removal activities.

36. The key point contained in the Discussion Document that we are in complete agreement with is that forestry is important in Aotearoa New Zealand.

37. The Discussion Paper,[16] Minister of Forestry Peeni Henare,[17] and Climate Change Commission[18] all agree that forestry is a key driver to Aotearoa New Zealand meeting its international and domestic emissions reduction targets. The Paris Agreement states that "*Parties should take action to conserve and enhance, as appropriate, sinks and reservoirs of greenhouse gases… including forests.*"[19] Of the four proposals in the Discussion Document, option 1 is the only proposal that accepts that Aotearoa New Zealand needs significant afforestation to meet these emissions reduction goals.

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[13] https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/nz-ets/our-advice-on-the-nz-ets/nz-ets-unit-limits-and-price-control-settings-for-2023-2027/
[14] *Discussion Document*, above n 1, at page 6, 7, 8, 10, 14, 16, 19, 20, 22, 23, 24, 29, 41, 42, 46-47, 51, 69, 70.
[15] *Discussion Document*, above n 1, at 10 and 20.
[16] *Discussion Document*, above n 1, at 10, 14, 19, 20, and 51.
[17] *Discussion Document*, above n 1, at 8.
[18] Climate Change Commission, "2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan" (April 2023) at 48.
[19] Paris Agreement, art 5.

38. The Discussion Document acknowledges that "*removals, including from forestry, will be critical for meeting future NDCs, which are expected to be progressively more ambitious*."[20] This makes sense given, according to the UN's Climate Action Tracker, 'land use and forestry' are the only category in which Aotearoa New Zealand's climate actions are considered sufficient.[21]

39. The ongoing importance of forestry, both exotic and indigenous, as part of Aotearoa New Zealand's climate response is a clear priority for this consultation as "*Aotearoa needs significant afforestation to meet its emissions reduction goals*."[22] Further, the Discussion Document identifies some of the co-benefits for our country,[23] including:

    - providing employment in rural communities;
    - providing economic returns for land that may otherwise be unproductive (e.g., far from ports, erosion prone, steep etc);
    - providing erosion control;
    - enhancing indigenous biodiversity; and
    - providing economic opportunities for landowners, including tangata whenua.

40. Further benefits of forestry could also be noted, including;

    - supporting adaptation by moving Aotearoa New Zealand towards a fibre-based economy, particularly with a 25+ year rotation and technological changes (e.g., bioenergy, replacements for steel and concrete etc);
    - providing capital returns to landowners that they can use to invest in other initiatives (e.g., social housing, green tech, just transition for impacted communities); and
    - provides farmers the opportunity to utilise their own land to offset their emissions in a cost effective, self-sufficient manner.

41. In terms of NZCF's business, carbon forestry is offering a lifeline for rural landowners. Our team engages with farmers and rural landowners every day, particularly in relation to forest leasing arrangements, which allow forest establishment and productive farming to co-exist. The increased frequency and severity of once in 100 -year weather events are making climate change very real for farmers and rural communities. The benefits that farmers see in carbon forestry include:

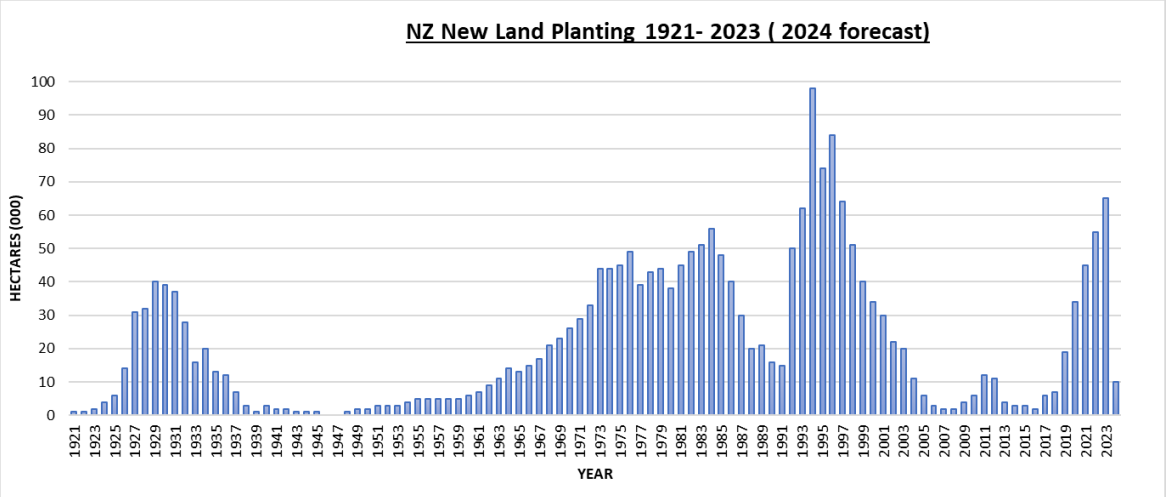
    - Financial returns – earning additional income on marginal land which is not otherwise profitable for the farm;
    - Diversification – diversification of income streams;
    - Risk management – when a Government finally imposes emissions obligations on agriculture, or if consumer / retailer expectations dictate that food producers must prove emissions reductions, an integrated farm forest is an ideal offset and mitigation strategy;

[20] *Discussion Document*, above n 1, at 42.
[21] https://climateactiontracker.org/countries/new-zealand/ (viewed on 2 August 2023)
[22] *Discussion Document*, above n 1, at 20.
[23] *Discussion Document*, above n 1, at 10 and 20.

- Branding – consumers are demanding sustainability as a minimum requirement. Aotearoa New Zealand's food has many miles to travel to market and additional evidence of emissions reduction activities is being demanded; and
- Succession – with Aotearoa New Zealand's aging population, farming is not immune. Carbon rental creates a passive income which can help the family retain the land.

42. While some interest groups would have you believe that trees are taking over the country, forcing out farms and destroying rural communities, the facts do not support these claims. Rural communities have always been evolving. Change will remain a constant, forests only make up a small fraction of land use compared to farms and remains so. As at 1 April 2022, Aotearoa New Zealand net stocked planted production forest covered about 1.76 million hectares[24]. This is only about 4,000 ha more than in 2008[25] and the 2022 area is still 70,000 hectares below the 2003 net stocked planted production forest area of 1.83[26] million hectares. This large deforestation has yet to be addressed by recent and current new planting. Part of the reason for this was as a result of large-scale dairy conversions in the past which led to substantial clearing of forests and higher emissions intensive farming operations. Aotearoa New Zealand's contribution to global warming is disproportionately high due to significant historical deforestation. At current and projected levels of forestry in Aotearoa New Zealand, we are still nowhere near offsetting this impact.

43. Taking a long term view, while annual forest planting has been increasing over recent years, it is not the highest we have seen, and over the long term is balanced against years of low planting and high deforestation. The chart below uses actual figures from the National Exotic Forest Description up to 2021, with estimates for 2022-2024. A recent phone survey of major forestry planters found planting intentions for 2024 of about 10,000 hectares. This is a direct result of the consultation.



44. Rather than hollowing out rural communities, carbon forestry offers farmers the flexibility and benefits listed above. A 2022 PWC report found that exotic forest transitioning to indigenous

[24] National Exotic Forest Description, 1 April 2022
[25] NZFOA Facts and Figures 2009-2010 - 1.761 million ha 1 April 2008
[26] NZFOA Facts and Figures 2004-2005 - 1.827 million ha 1 April 2003

forests creates the most local jobs (6.3 FTE per 1,000ha compared with 4.7 FTEs for sheep and beef on low productivity land and 2.0 FTEs for permanent carbon forestry)[27].

45. As a country, we must stop thinking in silos of 'us versus them', or 'farming versus forestry'. Instead, we should be thinking about integrated land use. That is how we operate with our farming partners - farms and forests together, for our mutual benefit and for the benefit of the country and environment.

46. Given that forestry's importance is central to the Discussion Document's objectives, it is therefore surprising that options 3 and 4 have been put forward. Both options seriously undermine forestry participation, so much so that it will have the effect of substantially reducing future emissions removals, leaving Aotearoa New Zealand destined to fall well short of its emissions reduction targets.

THERE IS NO NZU OVERSUPPLY, AND SO NO CASE FOR CHANGE

47. **Summary:** A key justification for the proposals contained in the Discussion Document is that high levels of afforestation will result in an "oversupply" of NZUs in the ETS, which will lead to reducing NZU prices which in turn will not sufficiently incentivise emitters to reduce their emissions. We completely disagree that there will be an NZU oversupply and as such there is no case for changing the ETS. How can there simultaneously be an oversupply of NZU's, and a Government expectation that Aotearoa New Zealand will fail to meet net-zero by 2050 such that the Government plans to spend billions of dollars to buy offshore carbon credits to make up the difference? It simply does not make any sense.

48. A key justification the Government has used for the proposals contained in the Discussion Document is that if there is enough additional afforestation there will be an 'oversupply' of NZUs in the market, potentially as early as the late 2030's. The Government's claim is that this oversupply will drive down NZU prices and undermine progress to reduce net emissions and therefore changes to the ETS are required.

49. The reality is that NZU prices only dropped in response to Government interference (e.g., this Discussion Document), not due to any perceived oversupply.

50. The Discussion Document acknowledges that the modelling used to reach this conclusion is inherently uncertain and depends on a range of assumptions, yet the Discussion Document did not provide the modelling or those underlying assumptions.[28] However, the Discussion Document undermines its own conclusions and modelling, stating that it relies on future projections of NZU supply and demand, "*which are themselves uncertain*".[29]

51. It is very concerning that the Government is basing all proposals on modelling described as "uncertain". Our initial impression was that the Government and Climate Change Commission are alone in saying that there will be an oversupply of NZUs. We have always understood that there would be an undersupply of NZUs, and we are not aware of any market participant that agrees with the Government's position as stated in the Discussion Document. So, we (and others) asked for all modelling information used in connection with the Discussion Document, which was only provided about 6 weeks into the 8-week consultation period.

[27] *PWC; Employment impact of different rural land uses; A report for New Zealand Carbon Farming; March 2022.*
[28] *Discussion Document*, above n 1, at 28.
[29] *Discussion Document*, above n 1, at 28.

52. We have reviewed the modelling (alongside others) and concluded that the models relied upon by the Government are not robust and that they contain several significant errors and false assumptions. Forecast NZU demand has been set at an unrealistically low level ignoring key sources of demand, while supply from forestry/afforestation has been forecast to reach and sustain record levels for more than 25 years – which is entirely unrealistic. We refer to the new planting chart at paragraph 43 – there is no equivalent period of 25 years where sustained high levels of planting have occurred.

53. NZCF commissioned PWC to provide an independent and expert opinion, of the Government's modelling[30]. They reached the following key conclusions.

    - There is a "*significant level of uncertainty regarding whether the supply of NZUs from forestry will exceed NZU demand*."
    - PWC was critical of the source used to model NZU supply noting that "*the mathematical model, which is used to derive the afforestation forecasts, is being used in a context where it cannot be expected to perform best. It is unclear whether it will derive a reasonable forecast of afforestation with NZU price inputs of around $100*."
    - PWC notes that the afforestation predicted by the mathematical model is "*much higher than historical levels. There is a question as to whether that amount of planting is achievable in practice, and whether there are practical constraints which would effectively preclude that result***."**

54. As a forestry business with one of the largest planting programmes in Aotearoa New Zealand, we agree with PWC. We consider the assumed level of afforestation to be entirely unreasonable and unrealistic – that is, trees will simply not be planted at the scale suggested in the Discussion Document over the period suggested, so there will be no oversupply of NZUs. Practical constraints include: constraints on seed supply; constraints on tree nursery capacity; financing constraints; constraints on available land for planting on the annual basis assumed; constraints on the contractor workforce needed to carry out all necessary establishment activities, including pre-plant spraying, planting, release spraying and other establishment activities.

55. The Government's approach to modelling and publication of the Discussion Document has been extremely irresponsible. The Discussion Document relies on Government models to support the argument for change.[31] There is no contemplation of a sensitivity analysis, or potential alternative outcomes, and no industry consultation was undertaken to test the modelling before release. Our clear impression is that the Government's modelling was produced to support the narrative contained in the Discussion Document. The result has been that the Discussion Document has caused significant market uncertainty, a loss of confidence in the ETS, and a substantial drop in NZU prices which is antithetical to the Discussion Document's claimed objectives.

56. In our opinion, there is and will be for the foreseeable future an undersupply of NZUs in the market and an upward NZU price curve, not an oversupply and a decreasing NZU price curve as claimed in the Discussion Document.

[30] *PWC; Review of Emissions Trading Scheme unit forecast supply-demand balance analysis; A report for NZ Carbon Farming; May 2023.*
[31] *Discussion Document*, above n 1, at 28.

57. Even if we accept the Discussion Document's premise for the sake of argument, we fail to see how an oversupply of carbon removals would negatively affect Aotearoa New Zealand and the world.

58. If there were an oversupply of NZUs (which we do not believe is the case), that presents a substantial export opportunity for Aotearoa New Zealand. Surplus NZU's simply indicates that foresters have been efficiently and effectively removing carbon from the atmosphere – the very thing that the planet desperately needs. Any NZUs produced will count towards our NDC, reducing the Governments overreliance on imported, substandard units and so reducing the cost to households. If there is any surplus, then if and when the NZETS is linked with overseas schemes there will be a valuable opportunity for Aotearoa New Zealand to export NZUs to other countries who need to acquire carbon credits to meet their own emissions reduction commitments. The Paris Agreement explicitly contemplates the international linkage of carbon markets.[32] Under Article 6, a party to the Paris Agreement, once links are established, may transfer carbon credits to help one or more parties meet their own climate targets. Therefore, opening our market internationally and giving Aotearoa New Zealand the opportunity to support the international climate change effort.

59. On a domestic level, opening the market would create export earnings for Aotearoa New Zealand. The Government should therefore be championing international sales of NZUs as part of its ETS, rather than stifling any removal activity.

60. If there was an oversupply (which we do not believe is the case) and no ability to export, any oversupply could also be managed by using existing ETS mechanisms which do not cause the serious adverse effects of the proposals contained in the Discussion Document, as described below in this submission. We briefly outline alternative options available to the Government for managing any oversupply and/or NZU prices, many of which involve no changes to the ETS, but simply the use of existing ETS levers.

    - As demonstrated by the July 2023 announcement to update the NZ ETS auction controls, using existing levers within the ETS can achieve desired outcomes such as increasing the NZU price. Immediately following this announcement, the NZU price rebounded back above $60 per unit. Auctioned NZUs do not reduce emissions – they do nothing for the environment and nothing to meet our international obligations. If we reduced the number of auction units available (which do not remove emissions) and produce more removal units (which do reduce emissions), this achieves multiple benefits by removing emissions, supporting the NZU price, and encouraging emissions reductions.

    - The Government could impose emission reductions obligations on agricultural emissions – agricultural emissions are not considered in the domestic supply / demand dynamics, but they are included in Aotearoa New Zealand's international obligations. This means that emissions (and the demand for NZUs) are currently substantially understated in Government modelling. Agriculture is our largest emitter, accounting for half of Aotearoa New Zealand's total greenhouse gas emissions.[33] While agriculture currently sits outside of the ETS, it is widely acknowledged that agricultural emissions need to be measured, priced and reduced. This is necessary to help Aotearoa New Zealand meet its international obligations, but increasingly for trade reasons as well

[32] Paris Agreement, art 6.
[33] https://www.mpi.govt.nz/funding-rural-support/environment-and-natural-resources/environment-and-climate-change-research/

(e.g., large food manufacturers like Mars, Nestle and Starbucks are seeking emissions reduction targets from their suppliers). Forestry removals offer farmers the perfect on-farm emissions offsetting tool – that is, a farmer can report on their emissions from their farming activities and also show emissions removals from forests established on their less productive land.

- Furthermore, farmers and the Government have stated that agricultural emissions are hard to abate. That is, with all the will in the world, it will not be possible to reduce all on-farm emissions in the near future, so we need a way to offset some emissions. Forestry removals provide the perfect tool to offset those hard to abate emissions.

- The Government could reduce industry allocations. Units are currently being released into the market by the Government through industrial allocation. The allocations of free credits are to trade-exposed emitters. These units do not remove emissions and they reduce demand for removal units. So, one of the existing levers available to the Government if needed would be to reduce the number of units allocated to industry.

61. NZCF agrees with the idea that we want 'right tree, right place, right purpose'.[34] We do not, however, support the use of the ETS as a mechanism to control land use when this is already captured by suitable mechanisms in our legal system. Usurping existing central and local land use regulations to try to influence forestry land uses via the ETS is entirely inappropriate.

THIS CONSULTATION IS CAUSING IRREPARABLE DAMAGE TO THE FORESTRY INDUSTRY AND WIDER ECONOMY

62. **Summary:** The Government's repeated interference in the ETS and regulatory reform has created significant uncertainty and has seriously unsettled the market. Publication of the Discussion Document resulted in a plummeting NZU price. The message being given to investors is that the Government is very willing to interfere with and undermine your property rights, including extracting value from your existing investments. Forest industry leaders have publicly announced that new forest investments have ceased, and no new planting will occur (other than in some very limited exceptions). This will lead to job losses in the regions, adding more cost to future taxpayers. The ETS has stopped functioning. Government revenue is down $700 million (and will fall further). Ultimately, this distrust of the Government and the ETS will damage Aotearoa New Zealand's ability to meet its climate change targets and force the Government to resort to purchasing overseas credits in order to meet our NDC.

63. It is widely accepted that forestry remains one of the most effective tools for removing carbon dioxide from our environment.[35] The Government is adamant that it is committed to meeting Aotearoa New Zealand's climate change goals and protecting our environment.[36] The Discussion Document insists that one of its goals is to ensure the ETS incentivises carbon removals from forestry. Therefore, it seems intuitive that protecting foresters' interest in remaining in the ETS and supporting their activities would be a priority of this consultation. It is not.

[34] *Discussion Document*, above n 1, at 20.
[35] *Discussion Document*, above n 1, at 10.
[36] *Discussion Document*, above n 1, at 10, and 14-17.

64. Options 3 and 4 are entirely antithetical to forestry participation and a thriving ETS, so much so that they are proposing to punish foresters for their past involvement in the ETS and forestry investments.

65. Option 3 proposes (among other things) imposing restrictions on forestry NZUs to reduce emitter demand for them (thus decreasing their value), restricting the number of units allocated for forestry removal activities (thus decreasing the value of forest investments and NZU entitlements) and putting an expiry date on forestry removals (which will reduce the value of such units). All these options punish foresters for their past investments. All reduce the value of forest investments. All are entirely inconsistent with a goal of supporting forestry removals. But, for anyone wondering why the NZU price has crashed and why forest investments and forest plantings have ceased – these proposals are a large part of the answer.

66. Furthermore, option 4 empowers the Government to restrict the use of NZUs so that forest owners could only sell NZUs to the Government and at an unknown price, but one at which the Government could control directly or indirectly. This effectively nationalises the NZU market. Again, this explains why NZU prices have crashed and why forest investments have ceased.

67. It is important to realise that a crash in NZU prices is not just theoretical, it is very real. For landowners, investors, and in particular Māori, these losses are real, and they are measured in billions of dollars. It has been estimated that the loss caused by the release of the Discussion Document is as follows:

    - Loss of value of existing forests = **$2.3 Billion**
    - Loss of value of forests that were planned to be planted = **$6.9 Billion**
    - Loss to tax payers

      Auction Revenue 2023

      - To date: $700m of lost ETS auction revenue
      - At Sept: $1 Billion
      - At Dec: $1.4 Billion
      - **$1.7 Billion** committed to emissions reduction projects which now cannot be funded.

      Imported Unit Cost 2030

      - **Additional** cost to households of units that would have been grown in Aotearoa New Zealand but now will have to be imported from offshore = additional **$2 Billion**

      Loss For The Market

      - Loss of value of units on hand = **$6.4 Billion**

68. Recent changes to auction settings have helped recover some of the losses, but there is lingering market uncertainty which will only be satisfied by immediately announcing the withdrawal of this consultation.

69. We cannot support option 2 either. While we support developing the offshore ETS linkages of schemes that might allow exports of NZUs (part of what is proposed in option 2), we do not support the Government being a buyer of NZUs. As illustrated throughout this submission, the

Government has repeatedly caused market disruption and uncertainty in the ETS. Given this track record, we cannot accept a situation where we would invest further in the ETS with the Government as the only buyer of NZUs. This would result in even greater uncertainty in the market. An example of this type of approach failing was seen in the Australian ERF with its carbon abatement contracts having the government as the sole purchaser. This approach led to suppressed prices and a lack of investment. A market requires depth and breadth to work efficiently.

70. The release of this Discussion Document has signalled to foresters that the Government is very willing to interfere with, and undermine, your property rights, including extracting value from your existing investments. Furthermore, the message to forest investors is that over the 25+ year investment in your forest, you can expect the Government to shift the goal posts on a regular basis. Anecdotally, and where relevant to our own business, we can attest that:

    - Forest investors are putting a freeze on new forest investments unless and until it is clear that the proposals will be dropped;
    - Forest owners are not going to undertake any new afforestation (with limited pre-commitments excepted – perhaps 10,000ha nationwide) unless and until it is clear that the proposals will be dropped;
    - Financiers have withdrawn funding for some new forest investments due to the proposals, the level of uncertainty in the market and the impact the proposals would have on forest investment returns;
    - The debt market is currently essentially closed for new forestry investment reliant on NZU revenues;
    - Reduced afforestation will cause job losses and business closures, not only with forest owners, but also with related businesses including nurseries, contractors, forestry advisers and forestry managers etc.;
    - These jobs will be lost in the regions, including those regions with the most vulnerable communities, which will not only result in further costs to the taxpayer, but also trigger related social issues; and
    - The adverse impacts will be long lasting (several years at least) as businesses will scale down or close, staff are lost to other industries / countries, and vital equipment is sold. So, even if the Government changed its mind now, we anticipate that the mere release of the Discussion Document has severely reduced forest investment and planting for at least several years. This is particularly concerning in the context of difficult commercial forestry market conditions, the current cost of living crisis, and the disproportionate impact these effects will have in regional and Māori communities.

71. The proposed restrictions on forestry will suppress new planting for years, meaning Aotearoa Aotearoa New Zealand will not meet its emissions reduction targets. Without immediate and decisive retraction of the Discussion Document, this will result in substantially reduced emissions removals, and Aotearoa New Zealand will fail to meet it's 2030 emissions removals goals without expending huge taxpayer funds on the purchase of offshore credits.

72. The Government currently plans to spend between $3.3 billion to $23.7 billion in additional offshore mitigation to meet Aotearoa New Zealand's 2030 NDC[37]. This is at the cost of Aotearoa New Zealand households and our economy. Implementing any option that restricts forestry will cause the cost of offshore mitigation to increase by an additional $2 billion beyond the Government's estimates. This is a surprising political judgement in an election year during a cost-of-living crisis but what is more upsetting is that it is entirely unnecessary.

73. What is even more galling is that offshore credits that Aotearoa New Zealand taxpayers will be buying are likely to be produced by overseas forests! The Government's proposals will decimate the local forestry industry, causing massive harm to our regional economies and putting New Zealanders out of work, just so that billions of Aotearoa New Zealand taxpayer dollars can be spent paying foreigners to grow trees in their countries. This really does beggar belief.

74. Forestry participants in the ETS are a domestic mechanism to offset emissions. We are established, reliable, long-term participants who are dedicated to helping Aotearoa New Zealand reach our climate goals. Yet the Government seems intent on stifling our investment and instead spending taxpayer money to stimulate an overseas economy, rather than simply invest in Aotearoa New Zealand business. Aotearoa New Zealand's priority should be focussing on domestic climate action, rather than purchasing offshore mitigation at the taxpayers' cost. In order to do that the Government needs to support foresters, let the ETS function as intended, and clearly and immediately abandon options 2 to 4.

75. Unfortunately, unless we get an announcement immediately, getting ETS removals back on track is unlikely to be quick, as forestry investments have long lead times. Planting and growing trees is not a tap that can be turned on and off. Therefore, without an immediate unequivocal announcement that the Government will abandon the consultation, we expect that the damage will last for years to come.

THE IMPACT OF THIS CONSULTATION ON MĀORI IS SIGNIFICANT IN TERMS OF LOSS OF WEALTH AND SELF DETERMINATION

76. While we cannot and do not purport to speak for Māori, we work closely with thousands of landowners, farmers and Māori / iwi enterprises. We want to express our concern that the impact of this consultation on Māori is significant in terms of loss of wealth and self-determination (given that Māori own 30-40% of Aotearoa New Zealand forests).

77. Other submitters will be better placed than us to provide specifics, but it is obvious that the proposals have already wiped billions of dollars off the balance sheets of Māori land trusts and organisation's existing investments in planting fast growing exotics on their lands. This policy denies Māori their Te Tiriti o Waitangi rights to determine what they can do on their tribal lands.[38]. For Māori, participation in the carbon economy was a once in a generation opportunity. The opportunity cost of this policy for the Māori economy has been estimated by others to be a loss of $16 billion.

78. It has been estimated that the loss to Māori caused by the release of the Discussion Document is as follows:.

[37] *Discussion Document*, above n 1, at 17; The Treasury and Ministry for the Environment. 2023. *Ngā Kōrero Āhuarangi Me Te Ōhanga: Climate Economic and Fiscal Assessment*. Wellington: The Treasury and Ministry for the Environment

[38] This has been described by Māori stakeholders as akin to the foreshore and seabed issue

LOSS FOR MAORI

1. Treaty Settlement losses:
    - Losses on existing treaty settlements = **$2 Billion** (est)
    - Units held in trust on behalf of Treaty Settlement Forests = **$72 million**
2. Loss of value of pre-1990 units on hand = **$550 million** (mostly Māori)
3. Loss of value to Māori Trusts = **$4 Billion** (est)
4. Loss of value to Māori foresters = **$4 Billion** (est)

Note: These losses may precipitate reopening of Treaty Settlements

79. Several extracts from a 21 July 2023 article by Te Kapunga Dewes in a Newsroom article entitled "*Māori foresters angry at 'destruction of value' in emissions trading scheme*" [39] summarise the situation and sentiment well.

- "*On the ground, I'm being told by angry Māori landowners and foresters that the Government's actions feel like "yet another punch in the face". Many just don't understand why the Government has chosen this path, after years of encouraging and supporting forestry investment. And, as this year's round of AGMs approach, they are struggling to find a justification for the tens of millions of dollars wiped off the balance sheets of individual Iwi trusts, to people who are relying on this money to help transform the lives of future generations*."
- "*We know the "model" used to forecast this apparent oversupply of units in last year's consultation documents was designed to deliver the desired political outcome by grossly overstating supply, extrapolating New Zealand's highest ever planting season into the future*."
- "*It is time for it to stop. The Government should withdraw this misguided consultation. It should listen to Māori voices – once reasonable and now increasingly strident. And it should return to the table, to work in true partnership as it agreed to do, in the co-design of a climate-resilient landscape for Aotearoa with our people and our forests at its heart*."

AOTEAROA NEW ZEALAND NEEDS TO MEET ITS OWN CLIMATE CHANGE TARGETS IN AOTEAROA NEW ZEALAND, NOT BY BUYING IMPORTED CARBON CREDITS

80. **Summary:** The Government's proposals will result in reduced forestry participation in the ETS, meaning substantially reduced forestry removals. This means the Government will need to buy offshore carbon credits to meet Aotearoa New Zealand's emission reduction targets. It is estimated that Aotearoa New Zealand will need to spend an additional $2 billion on offshore carbon credits, which will cost taxpayers as much as $2,800 per person just to meet Aotearoa New Zealand's 2030 international obligations. Unless the consultation is withdrawn, this cost will be repeated the decade after also, as forestry investment has ceased as a result of the proposals contained in the Discussion Document.

[39] https://www.newsroom.co.nz/maori-futures-a-political-football-in-emissions-trading-scheme-debate

81. The UN climate tracker gives Aotearoa New Zealand an overall climate action rating of "highly insufficient".[40] It specifically notes that "*New Zealand is set to meet by far the highest proportion of its target (two thirds of the action required) through buying international offsets compared with any other OECD country*." This is not a record to be proud of. For a country in a climate emergency, the message that we are sending to the world is that we are not willing to do anything about it in our own country, and we will simply expect others to do the work for us and then we will buy their carbon credits.

82. Forestry currently offers Aotearoa New Zealand the best opportunity to do something for ourselves to reduce our emissions. The only component of our climate action rated by the UN as sufficient is our 'land use & forestry' initiative, namely carbon removals from forestry. It makes no sense to now limit or restrict the one shining light of our climate action response (our forestry sector) to spend billions of taxpayer dollars overseas for other countries to act. The UN agrees, noting that such an approach "*exposes New Zealand to highly volatile prices in EU-ETS markets as well as increasing concerns about the quality of international offsets, given the high uncertainties around the verification, permanence and principles of additionality*."

83. When faced with all this cost on our economy – particularly being borne by our most vulnerable (who are also most vulnerable to the impacts of our rapidly changing climate), as well as the risks to our international reputation, we must consider whether there is a better way. How do we get the balance right between land use and meaningful climate action? How can we incentivise change, and bring rural landowners along with us, by providing real returns to the sector? How do we capture those gains, those jobs, and that investment in Aotearoa New Zealand? And how do we tackle climate change now, without impoverishing a generation who can't afford their cost of living to be ratcheted up any further?

84. There is a better way. And we are already doing it.

THE GOVERNMENT MUST URGENTLY AND UNEQUIVOCALLY STATE THAT IT WILL NOT IMPOSE REGULATORY CHANGES ON EXISTING FORESTRY AND NZU INVESTMENTS

85. **Summary:** Several of the Government's proposals would have retrospective effect and undermine property rights, including reducing NZU entitlements of existing forests, cancelling existing NZUs by imposing new expiry dates, and restricting how existing NZUs can be used and who they can be transferred to. Such proposals will have a material adverse impact on existing asset values, property rights and business contracts and other arrangements. They effectively punish existing forestry participants for having invested in climate action. If the Government fails to give unequivocal assurances that the proposed changes will not apply to existing forests and existing NZUs, this will have a serious and chilling effect on investment throughout Aotearoa New Zealand in all sectors. This is already being seen with a crash in NZU prices and industry wide statements about a freeze on new forest investments and forest planting.

86. The proposals demonstrate a worrying disregard for investors existing interests (in forests and NZUs) and property rights. As of 30 June 2023, 95 million NZUs are held in private accounts in the ETS register (described in the Discussion Document as the "stockpile").[41] This represents more than $5.7 billion worth of privately owned assets.[42] The value of forest investments could

[40] https://climateactiontracker.org/countries/new-zealand/
[41] EPA website statistics on privately held units: https://www.epa.govt.nz/industry-areas/emissions-trading-scheme/market-information/privately-held-units/
[42] Assumes an NZU price of $60, which is approximately where recent NZU spot prices have been.

also be expected to be into the billions of dollars. These proposals would detrimentally effect, and in one case potentially erase, some of those assets. We consider that these options, if pursued, set an extremely dangerous precedent in our legal system.

87. Option 4 dismantles the ETS and creates two new markets: one for emissions reductions and one for emissions removals. Under one proposal the Government becomes the mandatory purchaser of all forestry NZUs. If the Government is the only buyer of NZU's, the Government is nationalising those units. The Discussion Document contemplates whether this proposal should apply to the existing "stockpile" of NZUs. As the sole buyer of those units, the Government is able to "manipulate"[43] the NZU purchase price.

88. Proposing to apply restrictions to NZUs in the "stockpile" shows a concerning disregard for property rights. Those NZU owners invested in the ETS in good faith. They earned or acquired their NZUs on the understanding that those NZUs would be their property to manage and sell as they see fit, without Government interference.

89. The Discussion Document fails to adequately consider the long-term nature of forest investments. Forest investment decisions are typically made years in advance of tree planting with a 25+ year investment horizon, even longer for permanent forestry. Investors may have borrowed money, bought or leased land (with a mortgage), planted forests, engaged contractors and managers, and perhaps entered into long term NZU sale agreements. These investments rely on stability and certainty of the law. They rely on repeated historical commitments from the Government that it recognises and respects the long-term nature of forest investments. By proposing to restrict existing property rights in this way has an obvious adverse and retrospective effect, and seriously undermines investors' trust in the Government.

90. Option 3 also makes several proposals which undermine property rights and have retrospective effect. One of the options contemplates placing a restriction on the time removal units can be held to be used as part of surrender obligations (i.e., vintaging). This effectively puts a sudden, arbitrary expiry date on existing assets, operating to unilaterally devalue, and ultimately erase, that investment. For example, if a ten-year expiry date is put on NZUs, any 10-year-old NZUs would have no value. Nine-year-old NZUs would have a materially impaired value, and so on.

91. Another proposal within option 3 is to halve the NZU entitlement of forest owners, from 1 NZU for every 1 tonne of CO2 to 1 NZU for 2 tonnes of CO2.[44] This would halve the NZU production and return of existing forest investments. It is extraordinary that the Government is proposing to adopt a law change that would halve the value of forestry investments made by investors in good faith. This could cause losses of billions of dollars. Frankly this is something we would never have expected to see in a country like Aotearoa New Zealand which is supposed to respect property rights and the rule of law.

92. It is no surprise given the above that the NZU market price crashed. Nor is it any surprise that forest investments and forest planting have stopped.

93. Our legal advice is that law changes should not have retrospective effect. Legislation should also respect property rights. We are frankly astounded that the Discussion Document was published containing proposals which so clearly do not meet the legislative standards of Aotearoa New Zealand (or any developed democracy for that matter).

[43] Emissions Trading Scheme Policy Team, "ETS Review and Permanent Forestry Category Design – Consultation" (27 June 2023).
[44] Discussion Document, above n 1, page 62.

94. What is also concerning is that the Minister must be aware of this as he expects legal action. In a media interview on 24 July 2023, when asked whether he expected legal challenges to the review, Mr Shaw responded: "***Yes I am***. *Ultimately there's a consultation out. If people have got different evidence bases that the Government and the Climate Change Commission are working on, we would hope that they will share those as a result of the consultation.*"

95. When confronted during the 27 June 2023 Ministry for the Environment Q&A session the Ministry sent mixed messages about whether the proposed changes would have retrospective effect. On the one hand, assurances were given that as a general rule the Government is extremely cautious about retrospective law. However, officials also said (in the context of retrospectivity) that they would be balancing the "*fairness and effectiveness*" of policy changes. This seems to be saying that they are willing to make unfair law changes, so long as the impact is effective – or in other words, the ends justify the means. This is very disturbing.

96. The reason we say that the Government must urgently and unequivocally state that it will not impose regulatory changes on existing forestry and NZU investments is that the Discussion Document (and messages given in consultation sessions) is already having a serious and chilling effect on forest investments in Aotearoa New Zealand. The longer the lack of confidence and certainty continues the more serious, expensive, and long lasting the impacts will be.

97. We also expect the impacts to be felt throughout Aotearoa New Zealand in all sectors, because any investor in Aotearoa New Zealand must have serious concerns that a government would change the law to intentionally undermine existing investments made in good faith. We elaborate below.

    - Retrospective changes to the ETS which undermine value in existing forest and NZU assets will cause investment in sustainable forestry to cease or substantially reduce.
    - But, this chilling effect on investment will not be limited to just forestry – this will infect all investments in all sectors of the Aotearoa New Zealand economy.
    - The investment community will not see these proposed retrospective law changes as an ETS risk, or a forestry risk, but as a wider regulatory risk which could apply to any sector. That is, they will see Aotearoa New Zealand as a country where the Government has shown a willingness to change the law in a way which reduces the value of existing investments.
    - So, investors will add a risk premium to their future investment assessments. In other words, investors will demand a greater return from their investments in Aotearoa New Zealand to compensate them for the extra regulatory risk they are taking by investing in Aotearoa New Zealand.
    - If investors cannot achieve the higher risk adjusted return they need, they will simply not invest in Aotearoa New Zealand.
    - What this looks like in real terms is: increased difficulty in finding investment for new projects; less investment across the economy; fewer projects; fewer jobs; less economic activity; a lower tax take for the Government.

FLAWED CONSULTATION PROCESSES

98. **Summary:** We appreciate that it is necessary for the Government to review the ETS, but the proposals put forward in this consultation, and lack of transparency in underlying modelling and data, have severely undermined the legitimacy of the consultation. Furthermore, the Discussion Document is only the most recent in a long line of consultations which propose moving the ETS goal posts yet again. The Climate Change Response Act 2002 has been amended more than 30 times since 2002. The ETS has been the subject of four major reviews in that time. In that same period, a Pinus radiata forest planted in 2002 has not yet even reached harvest age. Forestry is a long-term investment. Investors need regulatory certainty and consistency – they need to know that if they plant a forest today, their fundamental rights and obligations in respect of that forest during its lifetime will be the same. Given the level of regulatory interference, it is no surprise that investment in forestry has stalled.

99. We appreciate that it is necessary for the Government to review the structures and mechanisms built into the ETS. Consultation is just one facet of that review process and a fundamental principle of good lawmaking. Principles of meaningful consultation are reflected in legislation and regulation. However, this Discussion Document cannot reasonably be considered an opportunity for meaningful consultation.

100. The Government failed to release the underlying data and models until the final weeks of this consultation. We were still receiving new models from officials as late as 31 July 2023, providing only 8 working days for us to consume and test substantial amounts of data. All this, when it was obvious officials were in possession of the relevant information long before the publication of the Discussion Document. Furthermore, this is the very evidence that purports to justify the proposals contained in the Discussion Document. This information should have been proactively released with the Discussion Document. Or, at the very least, immediately released when many submitters asked for it. Instead, it has been released very late in the consultation process and in an unhelpful and piecemeal way. It's wholly unreasonable to expect a meaningful response in such a context.

101. ETS participants are also expected to consult on overlapping reviews. The related consultation document *A Redesign of the Permanent Forest Category* (**Permanent Forestry Document**)[45] released in tandem with the Discussion Document included a condemning list of "other related work." This detailed half a dozen different sets of policy work being undertaken in the remainder of this year.

102. We are being asked to consult on this Discussion Document contemporaneously with the Permanent Forestry Document. This is difficult in and of itself, as the topics in the two documents will reflect on each other, having an echo of consequences that we cannot foresee until the other is resolved.

103. If that was not complicated enough, we also have outstanding reviews that the Government is currently considering. For example, the Tranche Two Cost Recovery consultation[46] closed in May and we do not foresee any immediate conclusion to that unreasonable and drastic proposal. That consultation proposed to impose extreme ETS cost increases that forestry participants

[45] Ministry for Primary Industries (2023). A redesigned NZ ETS Permanent Forest Category: *A discussion document on proposals to redesign the permanent forest category in the New Zealand Emissions Trading Scheme (NZ ETS)*. Wellington: Ministry for Primary Industries.
[46] Ministry for Primary Industries *Forestry in the ETS: Proposed updates to cost recovery tranche two* (Ministry for Primary Industries, MPI Discussion Paper No: 2023/05, March 2023).

would need to consider before investing any further in the ETS. There are many other ongoing relevant consultations, but we do not intend to list them all.

104. How can we reasonably be expected to consult on this Discussion Document when so many others are already on foot? Further, how can investors and participants be expected to trust the Government and the ETS when the rules and mechanisms seem to be in constant flux?

CONCLUSION

105. The Government must immediately withdraw the consultation and leave the ETS to operate on a status quo basis, which (subject to the outcome of other consultations) will encourage forestry removals while maintaining a steadily increasing NZU price. This must be done immediately and unequivocally if we are to limit the damage to NZU prices, market confidence, and certainty caused by the publication of the Discussion Document.

106. We welcome the opportunity to talk to this submission.

CONSULTATION QUESTIONS

2. Chapter 2

2.1. Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

- We completely disagree with the Discussion Document's assessment.
- One of the key justifications for the proposals in the Discussion Document is that high levels of afforestation will result in an "oversupply" of NZUs in the ETS, which will lead to reducing NZU prices which in turn will not sufficiently incentivise emitters to reduce their emissions. We completely disagree that there will be an NZU oversupply, so there is no case for changing the ETS. How can there simultaneously be an oversupply of NZU's, and a Government expectation that Aotearoa New Zealand will fail to meet net-zero by 2050 such that the Government plans to spend billions of dollars to buy offshore carbon credits to make up the difference? It simply does not make any sense.
- The Discussion Document relies heavily on flawed and unsubstantiated modelling which was designed by officials to support the proposals, but upon scrutiny that "modelling" simply does not support a conclusion of detrimental oversupply.
- We have reviewed the modelling (alongside others) and have concluded that they are not robust and contain a number of significant errors and assumptions. Forecast demand has been set at an unrealistically low level ignoring key sources of demand, while supply from forestry/afforestation has been forecast to reach and sustain record levels for more than 25 years.
- NZCF commissioned PWC to review the Government's modelling[47]. Their conclusions were:
    1. There is a *"significant level of uncertainty regarding whether the supply of NZUs from forestry will exceed NZU demand."*
    2. they were critical of the source used to model supply noting that *"the mathematical model, which is used to derive the afforestation forecasts, is being used in a context where it cannot be expected to perform best. It is unclear whether it will derive a reasonable forecast of afforestation with NZU price inputs of around $100."*
    3. they note that the afforestation predicted by the mathematical model is *"much higher than historical levels. There is a question as to whether that amount of planting is achievable in practice, and whether there are practical constraints which would effectively preclude that result."*
- We believe that there is, and will be for the foreseeable future, an undersupply of NZUs in the market and an upward NZU price curve, not an oversupply and a decreasing NZU price curve as claimed in the Discussion Document.

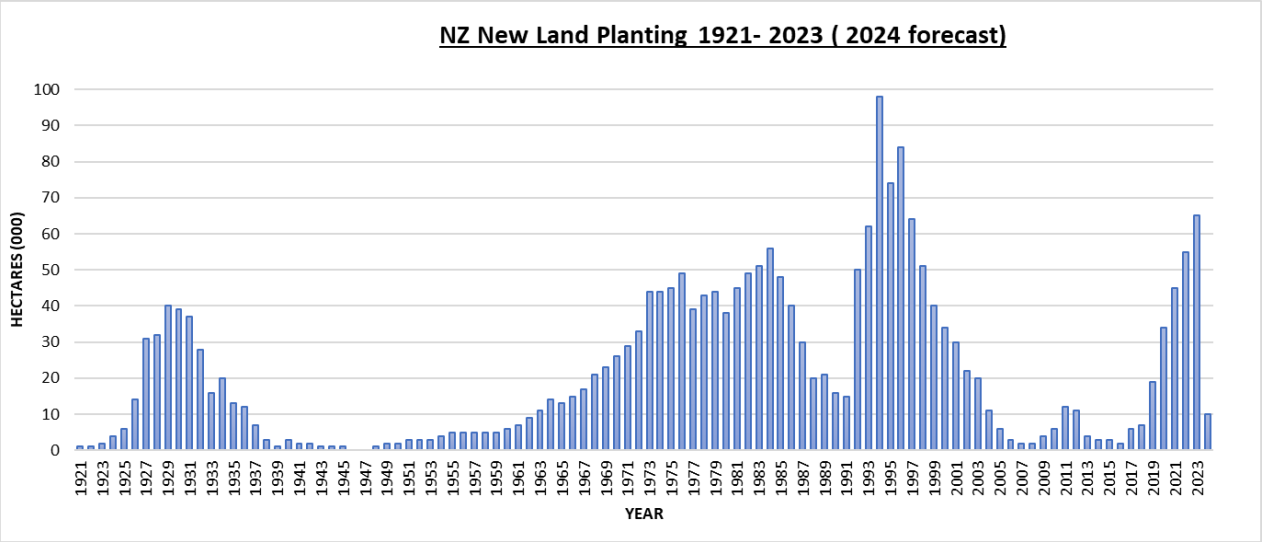
[47] *PWC; Review of Emissions Trading Scheme unit forecast supply-demand balance analysis; A report for NZ Carbon Farming; May 2023*

2.2. Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

- The ETS has been working (i.e., until recent regulatory interference). A recent Stuff article from 20 July 2023[48] quotes Statistics NZ data that emissions have dropped 9% in 3 years. The article cites various examples of emitters reducing their emissions, including cuts at metal making factories, overall manufacturing emissions dropping, and green electricity.
- In July 2023, Statistics NZ reported a 1.8% fall in Aotearoa New Zealand's emissions for the December 22 quarter.[49]
- Statistics NZ said MBIE statistics showed *"that the share of renewable energy sources increased to 94.7 percent in December 2022, a level not seen in decades, with a historically low proportion of gas and coal being used to generate electricity."* This is a clear indication of a functioning ETS.
- At the same time, removals have been increasing as afforestation occurs and forests are registered in the ETS. These forests are providing jobs and investment opportunities in regional Aotearoa New Zealand and funds to invest in further emissions reduction activities. Aotearoa New Zealand is in the fortunate position to be able to use forestry to transition to lower gross emissions over time in a manner that gives emitters time to find a way to reduce their emissions.

2.3. Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?

- Forest investment has increased over recent years as the NZU price has been increasing. Public forest planting statistics from the National Exotic Forest Description show this.



[48] https://www.stuff.co.nz/environment/climate-news/132583115/from-a-high-in-2019-emissions-have-fallen-for-three-straight-years
[49] https://www.stats.govt.nz/information-releases/greenhouse-gas-emissions-industry-and-household-december-2022-quarter/#:~:text=From%20the%20September%202022%20quarter,down%201.1%20percent%20(21%20kt)

- Importantly they also show that over time afforestation has highs and lows – there has never been a steady state of high afforestation for many years on end (as suggested in the Government's modelling).
- Also, while a forecast only, 2024 planting is estimated to fall to about 10,000 (being only pre-committed planting). This is due to the uncertainty and lack of confidence caused by Government interference in the market, including the NZU price drop caused by the Government.
- New forest investments have stopped. New planting has stopped (other than limited exceptions where planting is pre-committed). They will only restart if the consultation is withdrawn promptly and unequivocally.

2.4. Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

- No, we disagree with the Discussion Document's summary, which continues to be rolled out in Government discussion documents on an almost 'copy and paste' basis, despite being consistently debunked by the forestry industry.
- "Aotearoa needs significant afforestation to meet its emissions reduction goals."[50]
- NZCF firmly believes in the ethos of the right tree for the right place and over 95% of our 85+ million trees are planted on low-productivity, marginal land. We work with over 6000 partner landowners, farmers, and with Māori / iwi enterprises, returning more than $105 million to the rural sector. Forestry stimulates rural economies, offering job and economic opportunities. The concerns articulated around unmanaged forests are overblown – forest owners want to manage their land to protect their investment and maximise economic and environmental returns.
- Our forests are carefully planned, appropriate locations and conditions are selected that, with proper active management and long-term resourcing, will become healthy, sustainable, complex native forests. Concerns around fire, wind and storms are exaggerated, given well-managed forests factor in all such risk.
- We briefly respond to each of the claimed impacts of exotic afforestation below.
    - **Employment**: The Discussion Documents states that while not always the case, unmanaged permanent forestry can involve fewer jobs and has flow-on effects for rural communities. Well managed forests create more jobs, with a 2022 PWC report showing that actively managed transitioning forests create the most local jobs (25% more than sheep and beef farming on low productivity land).
    - **Exports**: The Discussion Document states that unmanaged permanent forestry generates fewer exports than other land uses. Exporting of NZUs is a significant opportunity for Aotearoa New Zealand. Article 6 of the Paris Agreement contemplates international linking of ETS schemes and Aotearoa New Zealand is exploring these. Rather than describe lack of exports as a challenge, it should be seen as an opportunity.
    - **The Environment**: The Discussion Document states that unmanaged forests, particularly permanent exotic forests, may also have environmental issues

[50] *Discussion Document*, above n 1, at 20.

associated with them (e.g., fire, disease, wilding pines), which must be balanced against the environmental benefits forestry can provide (e.g., erosion reduction, improving soil conservation, flood regulation, and water quality). Well managed forests enhance the environment. Again, we do not see this as a challenge, but an opportunity and benefit. Environmental risks arise in relation to any land use if that land use is poorly managed. The benefits of forestry are numerous, and on balance the benefits clearly outweigh potential risks when well managed.

- **Lack of Flexibility**: The Discussion Documents states that relying on forestry to achieve our climate change goals (including our emissions budgets and domestic 2050 target, as well as our NDCs) means that, once land is forested, it needs to remain forested. Converting land to permanent forestry therefore reduces the flexibility of land uses. Land use changes occur every day. They have occurred ever since man arrived in Aotearoa New Zealand and they will continue to occur. In Aotearoa New Zealand's recent history large areas of forest were deforested to convert land to high emitting dairy farms, arguably reducing the flexibility of that land use. The reality (as opposed to the political spin) is that a relatively small area of otherwise unproductive land is being converted to forestry, with substantial benefits.

3. Chapter 3

3.1. Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

- NZCF supports both gross emissions reductions and increased removals (which results in net emissions reductions), provided steps to reduce emissions do not undermine options for landowners and foresters. These objectives are not mutually exclusive and should not be treated as such.

- The ETS, when left alone, effectively drives both gross and net emissions reductions. The NZU price is the key driver to reduce emissions. This was gradually increasing, therefore gradually encouraging emissions reductions, until December last year, when the Government began to interfere in the ETS's operation.

3.2. Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

- The premise of the ETS is that over time increased NZU prices will incentivise emitters to reduce their emissions. This was working, before Government intervention crashed the NZU price and undermined the operation of the ETS.

- The proposals contained in the Discussion Document will have higher cost implications for Aotearoa New Zealand taxpayers, communities and households, because a substantial reduction in forestry removals will need to be replaced with the purchase of offshore carbon mitigation.

3.3. How important do you think it is that we maintain incentives for removals? Why?

- It is extremely important that the ETS maintain incentives for removals. Without them, afforestation in Aotearoa New Zealand will stall. It already has. It will only recommence if investors are given certainty and confidence in the ETS.

- As established repeatedly in our submission, it is widely accepted that forestry is the key driver to Aotearoa New Zealand meeting its international and domestic emissions reduction targets. If the Government wants to give Aotearoa New Zealand its best chance of meeting our international and domestic climate targets, it will immediately withdraw the consultation.

4. Chapter 4

4.1. Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

- We recognise that we are not best placed to speak to the implications for Māori.
- We only note that, in support of our Māori partners who each wish to participate in the carbon economy, meaningful engagement and consultation is necessary to achieve any outcomes supporting an effective and efficient forestry ETS infrastructure. That has not been achieved by this rushed, vague, and overlapping consultation process.
- Our observation would be that repeated Government discussion documents pay only lip service to Māori interests, and that Government proposals are then designed and pushed through without true co-design, partnership, or meaningful engagement.
- This approach is well demonstrated by the massive losses caused to Māori by the release of the Discussion Document without any genuine pre-engagement with Māori. If genuine pre-engagement had occurred, Māori could have explained the implications and if the Government had listened, the harm caused could have been avoided.
- The proposals have already wiped billions of dollars off the balance sheets of Māori land trusts and organisation's existing investments in planting fast growing exotics on their lands. This policy denies Māori their Te Tiriti o Waitangi rights to determine what they can do on their tribal lands. For Māori, participation in the carbon economy was a once in a generation opportunity. The opportunity cost of this policy for the Māori economy is estimated to be a loss of $16 billion.

4.2. What other interests do you think are important? What has been missed?

- See the answer to 4.1.

4.3. How should these interests be balanced against one another or prioritised, or both?

- See the answer to 4.1.

4.4. What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

- See the answer to 4.1.

5. Chapter 5

5.1. Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

- No, we disagree and we note that a gross prioritisation is not supported by our two legislated net targets, nor does it assist the acheivement of these legislated targets

- We support the reduction of both gross emissions and net emissions, as the ETS has always contemplated. That is why we support the status quo, and immediate withdrawal of the consultation. The ETS was working fine before Government interference.
- The proposals contained in the Discussion Document do not support forestry removals – they entirely undermine forestry activities. This has resulted in forest investment and forest planting stopping. This will substantially reduce forestry removals.
- The proposals have resulted in the crash of the NZU price, the opposite effect that the Government was hoping for, which in turn disincentivises gross emissions reductions.
- The ETS was never intended to be the sole mechanism by which Aotearoa New Zealand would meet its climate change targets, but it was doing a good job. Leave the ETS alone, and, as the Government was already doing, undertake other initiatives (e.g., technology investments) targeted to reduce gross emissions.

5.2. Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

- We support the reduction of both gross and net emissions, as the ETS has always contemplated. That is why we support the status quo, and immediate withdrawal of the consultation. The ETS was working fine before Government interference.
- However, support for gross emissions reductions must not undermine forestry removal activities (as the proposals in the Discussion Document do).

5.3. Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

- We agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals. The Government and Climate Change Commission have been consistent that, without more forests, Aotearoa New Zealand cannot meet its climate targets. This is reflected in the Discussion Document which repeatedly emphasises the importance of forestry in the ETS.
- However, operating the ETS on a status quo basis is the only option presented that will encourage emissions removals.
- Agriculture is our largest emitter, accounting for half of Aotearoa New Zealand's total greenhouse gas emissions.[51] While agriculture currently sits outside of the ETS, it is widely acknowledged that agricultural emissions need to be measured, priced, and reduced. This is necessary to help Aotearoa New Zealand meet its international obligations, but increasingly also for trade reasons (e.g., large food manufacturers like Mars, Nestle and Starbucks are seeking emissions reduction targets from their suppliers). Forestry removals offer farmers the perfect on-farm emissions offsetting

[51] https://www.mpi.govt.nz/funding-rural-support/environment-and-natural-resources/environment-and-climate-change-research/

tool – that is, a farmer can report on their emissions from their farming activities and also show emissions removals from forests established on their less productive land.

- Furthermore, farmers and the Government have stated that agricultural emissions are hard to abate. That is, with all the will in the world, it is expected to be difficult to immediately reduce all on-farm emissions, so we need a way to offset some emissions. Forestry removals provide the perfect tool to offset those hard to abate emissions.

5.4. Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

- The primary assessment criteria of "incentivises additional gross emissions reductions" must come with the proviso of "without disincentivising emissions removals".
- The proposals contained in the Discussion Document act as a disincentive to forestry investments and so disincentivise emission removals. The NZU price was strong and stable before Government interference. If gross emissions reductions are prioritised ahead of emissions removals, a substantial reduction in emissions removals will occur, resulting in Aotearoa New Zealand failing to meet its climate change commitments.
- NZCF supports both gross emissions reductions and increased removals (which results in net emissions reductions), provided steps to reduce emissions do not undermine options for landowners and foresters. These objectives are not mutually exclusive and should not be treated as such.
- The criteria "incentivises emissions removals" incorrectly only considers the contribution of emissions removals in the "short to medium term" when forestry investments are long term investments.
- Forest investments are 25+ year investments, and permanent forest investments obviously have an even longer horizon. Regulatory certainty and consistency over the long term is crucial. Necessary investments will only be made if investors understand the regulatory environment over the life of their investment.
- **Key Considerations**: Of the proposals in the Discussion Document, only the status quo would deliver on the following key considerations.
    - Supports meeting NDC: Under current ETS settings, largely due to forestry removals, Aotearoa New Zealand was on track to meet its NDC requirements. The Discussion Document undermined confidence causing a stop to forest investments, meaning that now the only way to meet the NDC will be to buy offshore credits.
    - Functionality of the NZ ETS market: The proposals in the Discussion Document adversely affect the functionality of the market, as demonstrated by the market failure upon publication of the Discussion Document. The proposals represent massive change, increased complexity, and a significant degree of control being taken by the Government – all of this led to an NZU crash and halt to forest investment.

- Costs to economy and households: As demonstrated in our submission, the proposals contained in the Discussion Document are already imposing costs and losses on the economy. If pursued, the Government will need to purchase billions of dollars more offshore, lower quality, carbon credits to meet our targets, passing that cost onto taxpayers.
- Distributional Impacts: Forestry actively supports rural and Māori communities. NZCF works with over 6,000 partner landowners, farmers, and Māori / iwi enterprises. Those partnerships have returned more than $105 million to the rural sector. Forestry contributes to the employment of between 35,000 and 40,000 people, often in rural communities. As established, this Discussion Document alone has already stifled forestry activity. The distributional impacts of the proposals are unacceptable on every level.
- Te Tiriti o Waitangi: We are not best placed to speak to the implications for Māori. We only note that, in our opinion the proposals do not give effect to the principles of Te Tiriti, rather they will cause billions of dollars of loss to Māori investors and communities. We consider that Treaty claims will be the inevitable outcome if any of the proposals are implemented (and they may be made regardless based on the consultation alone).
- Supports co-benefits: Ongoing forestry investment on a status quo basis under the ETS provides extensive co-benefits, including employment in rural communities, economic returns for unproductive land, erosion control, enhanced indigenous biodiversity, economic opportunities for landowners (including tangata whenua), supporting adaptation by moving Aotearoa New Zealand towards a fibre-based economy, providing capital returns to landowners that they can use to invest in other initiatives (e.g., social housing, green tech, just transition for impacted communities), and providing farmers the opportunity to utilise their own land to offset their emissions in a cost effective, self-sufficient manner.

5.5. Are there any additional criteria or considerations that should be taken into account?

- Yes. The government should have considered principles of justice, fairness, and the rule of law, ensuring changes do not have retrospective effect and respecting property rights. These should all be part of any good legislative process, but based on the content of the Discussion Document, there appears to have been no consideration of these crucially important legal principles.
- Also crucially important is the need for consistency, certainty, and market confidence. These have been included as key considerations in past consultations, and their omission here is very concerning and the consequences are obvious.

6. Chapter 6

6.1. Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

- Option 1 (or status quo) is the only option which will satisfy the objectives to reduce gross emissions while maintaining support for removals.
- We cannot support option 2 because, while it promotes overseas sales of NZUs, it proposes that the Government is the sole buyer. If the Government was a buyer of

NZU's this would compound the current problems, further devaluing NZU's and creating additional market uncertainty. Opening the market could assist with any perceived oversupply and provides Aotearoa New Zealand an opportunity to fight climate change on a larger scale, provided this is the only part of option 2 implemented.

- We wholly reject options 3 and 4. Both options effectively nationalise the ETS in flagrant disregard for property rights and impose severe restrictions on forestry. They will have detrimental retrospective impacts on existing contractual arrangements and undermine multi-year long investment decisions. Without an immediate announcement that the Government will not proceed with these options, foresters will be forced to continue their freeze on forest investment and planting. As a result, Aotearoa New Zealand will not meet its emissions reduction targets and will need to buy more offshore carbon credits, placing additional burden on taxpayers in the middle of a recession.

6.2. Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

- No, please see comments in our response to question 5.4. Only option 1 is feasible.

6.3. Of the four options proposed, which one do you prefer? Why?

- Please see comments in our response to question 6.1.

6.4. Are there any additional options that you believe the review should consider? Why?

- No.

6.5. Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

- General policy settings must not unduly hinder forestry investments.
- ETS costs reviews which have recently been consulted on must not impose unreasonably high costs on ETS participants, as to do so will disincentivise ETS participation.
- RMA law reform must not impose unduly restrictive regulation on forest establishment and management for similar reasons.
- According to the UN's Climate Action Tracker, 'land use and forestry' is the only category under which Aotearoa New Zealand's climate action is considered sufficient, and it is the only part of the ETS which is currently helping Aotearoa New Zealand to meet its climate change goals. Many law reform proposals and policies are creating strong headwinds which will undermine forestry in the ETS, based on poor analysis, lack of understanding, and politics.

6.6. Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

- We strongly recommend the Government engages in good faith and in a meaningful way with Māori groups. It has clearly failed to do so up to this point.

7. Chapter 7

7.1. Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

- We repeat our key submission that the Government must immediately withdraw the Discussion Document and leave the ETS to operate on a status quo basis. The Discussion Document is causing serious market uncertainty and undermining confidence in the ETS. Every moment that this uncertainty remains, the damage is compounding, making the road to recovery longer, more difficult, and more expensive.
- Aotearoa New Zealand primarily needs forestry removals to meet its NDC. That should be the priority. Additional types of removals which do not help meet the NDC, are simply a "nice to have". This could be explored in the future once the NDC is well under control.
- Constant tinkering with the ETS and related policies is already proving extremely damaging. The current ETS was encouraging forestry before the Discussion Document brought an end to that.
- If the government is trying to incentivise other environmental benefits it should do that outside of the ETS to avoid distortions, e.g. biodiversity credits. Keep the ETS focused on carbon reductions and removals.

7.2. If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

- We firmly believe in the ethos of the right tree for the right place. Our organisation actively manages its nationwide, conservation-focused estate transitioning from exotics to indigenous species. It does this through an actively managed, science-based transition process that recreates complex bio-diverse ecologies in locations where they once featured so prominently. Today our forests store one tonne of carbon every 13 seconds, and the total stored now exceeds 25 million tonnes.
- Our forests already deliver a wide range of co-benefits, including employment in rural communities, economic returns for unproductive land, erosion control, enhancing indigenous biodiversity, economic opportunities for landowners (including tangata whenua), supporting adaptation by moving Aotearoa New Zealand towards a fibre-based economy, providing capital returns to landowners that they can use to invest in other initiatives (e.g., social housing, green tech, just transition for impacted communities), and providing farmers the opportunity to utilise their own land to offset their emissions in a cost effective, self-sufficient manner.
- The ETS is already delivering these co-benefits. There is no need to change it.
- We would warn against trying to directly incentivise more indigenous forest establishment. It has been well established and accepted by the industry and Government that indigenous forests are more expensive to establish, harder to manage, and sequester less carbon than exotic forests. Transition forests will ultimately result in the establishment of indigenous forests, but in a way that is financially achievable and sustainable.
- We do not support the other proposals in the Discussion Document, so we do not support co-benefits which require the adoption of options 2 to 4.

7.3. Should a wider range of removals be included in the NZ ETS? Why/Why not?

- See our above answers to 7.1 and 7.2.
- The immediate priority must be to get the ETS back on track on a status quo basis, so that we increase our chances of achieving our NDC. We do not support efforts to research changes to the ETS to widen removal types, when the priority must be to fix the damage done by this consultation.
- Once certainty and confidence in the ETS has been restored (which may take years) and we are back on track to meeting our NDC, we would not have any concern with exploring other removal options (e.g., wetlands, additional pre-1990 removals from good management practices etc). But, if these do not help meet the NDC, they cannot be the priority right now.

7.4. What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

- No comment.

via email: etsconsultation@mfe.govt.nz

7 August 2023

Review of New Zealand Emissions Trading Scheme

Mercury welcomes the opportunity to provide feedback on the Review of the New Zealand Emissions Trading Scheme (NZ ETS), no part of our submission is confidential. Encouraging both decarbonisation and afforestation is essential for an equitable and sustainable low emissions transition. The NZ ETS is an important mechanism for helping to achieve these goals. Mercury supports reforming the NZ ETS to shift the focus from net emissions towards gross emission reductions while managing the amount of exotic forestry planting driven by the scheme. We note this approach aligns with recent advice from the Climate Change Commission (Commission)[1] that such changes are necessary because the existing NZ ETS architecture, combined with the relatively low cost of using forests to capture carbon, is likely to result in extensive afforestation in the near term, which in turn is likely to slow efforts to reduce emissions at their source. Maintaining a scheme that makes it cheaper for emitters to plant trees or buy NZUs off foresters than it is to take steps to reduce their gross emissions, is unsustainable in the long term.

Importance of well-signalled, orderly reform

Ideally, any changes to the NZ ETS would be decided and communicated relatively quickly. If stakeholders know the direction of travel, and key milestones, this will increase confidence in the NZ ETS. Ad hoc decision making, a short term focus, or unexpected decisions, risk undermining decarbonisation efforts (in both greenhouse gas abatement and forestry planting).

We have seen the effects of a loss of confidence in the NZ ETS after Cabinet's 2022 decision not to follow Commission advice on ETS settings. This unexpected decision left market participants struggling to determine what NZUs were worth and to predict their future value. This manifested in a decline in the trading price for NZUs, less volumes traded on the secondary market, and the failure of the first two carbon auctions in 2023. Likewise, foresters looking to plant trees put their plans on hold.

Mercury supports the Government signalling a commitment to prioritise gross emissions reductions and welcomes the recent decision to follow the Commission's advice for the NZ ETS unit limits and price control settings for 2024-2028 effective from the 6 December auction.

Significant policy changes require transitional arrangements

Mercury has noted the options outlined in the current discussion document. We support the high level assessment of the options and agree with issues identified requiring resolution in order to incentivise gross emissions reductions while managing afforestation. The options canvassed range from using existing levers available to the

[1] Climate Change Commission, Advice on NZ ETS unit limits and price control settings for 2024-2028, March 2023 and 2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan, April 2023.

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Government with some minor amendments to the Climate Response Act, through to establishing separate markets for Government issued NZUs and forestry NZUs.

A development that will assist with an orderly transition to a gross emission reduction approach is the recent decision to follow Commission advice to tighten unit supply and price control settings for 2024-2028.[2] There will be a further opportunity to streamline policy settings when the second Emissions Reduction Plan (ERP) is released. The Commission recently consulted on its draft advice to inform the ERP, which will be finalised and presented to Government by 20 December 2023. This advice includes suggestions that have informed the current consultation along with additional suggestions, including improving the design of the industrial free allocation policy to ensure it is fit for the long term and proportionate to emissions leakage risk. Another step could be to utilise existing levers in the manner suggested under Option One in the Consultation Paper while undertaking design work for a more significant change as indicated by Options Three and Four. Clarity of approach, including intermediate steps is essential to give the market as much certainty as possible.

Whatever changes are contemplated, Mercury supports Government considering options for managing the transition from the existing NZ ETS which is based around net emissions to a gross emissions approach. It will be important to consider the rights and interests of those who have already purchased NZUs, those who have entered into long term offtake contracts to purchase NZU's from forestry owners and forestry owners and emitters who have made investment decisions based on current NZ ETS settings.

It may be necessary to adopt some form of 'grandparenting' of existing NZUs and/or set expiry dates for existing NZUs so that market participants have some notice of changes and the ability to plan accordingly. Changes should not apply retrospectively. Likewise, where changes are likely to have disproportionate impacts on those who are most vulnerable, complementary measures may need to be considered to ensure an equitable transition.

Mercury looks forward to being involved in further discussions on how to reform the NZ ETS.

Yours sincerely

[redacted]

[redacted]

[2] https://www.beehive.govt.nz/release/emissions-trading-scheme-settings-updated

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10 August 2023

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Consultation Response: Review of the New Zealand Emissions Trading Scheme

The following is a submission by Easter Bay Consultants Ltd (Easter Bay) in response to the consultation document *Review of the New Zealand Emissions Trading Scheme* published by the Ministry for the Environment (MfE) on 19 June, 2023.

Easter Bay is a London-based niche firm of consulting economists with economic and regulatory expertise. We regularly support governments and regulators internationally on policy issues such as those raised by the consultation document.

This response is written on behalf of Easter Bay, and not on behalf of any specific client of Easter Bay.

We believe the consultation document has set out the required elements of a policy analysis of this type, namely:

1. Definition of the problem situation
2. Definition of criteria against which alternative potential solutions (i.e. options) be evaluated
3. Development of suitable options

The final steps, post-consultation, being:

4. Evaluation of the options from Step 3 against the criteria from Step 2; and
5. Section of the best option accordingly.

However, we believe there are key improvements that could be made to each of Steps 2 and 3 – relative to those set out in the consultation document – which if applied would tend to result in a very different outcome in Step 5: Selection of the best option.

Definition of the problem situation

While the problem situation is complex, with multiple objectives and potential co-benefits, we believe there is value in taking a step back and considering the big picture. MfE has succinctly summarised that the big picture problems arising from the current policy settings are twofold:

1. Prioritise gross emissions (*reductions*); and

2. Manage the amount of exotic forest planting driven by the scheme (forestry being the main source of *removals*).

Against this background we are concerned that the criteria set out in the consultation document are somewhat inappropriate in terms of both definition and the weight that are implied for each.

Step 2: Definition of criteria against which alternative potential solutions (i.e. options) be evaluated

We think the most important criteria are:

1. *Effectiveness* in solving the problem as defined;
2. *Efficiency*; and
3. *Non-discrimination*.

Effectiveness is important because not all options will address the problem situation as well as each other.

Efficiency is important because the chosen solution should be low cost, and should not introduce unnecessary additional costs or unintended consequences.

Non-discrimination is important as a key foundation upon which efficient markets and effective regulation must rest.

Step 3: Development of suitable options

Considering the simple and high-level problem definition above, we believe there is a very straightforward option that should be added to the list for evaluation as a new Option 5.

Option 5 would directly and explicitly manage – and limit – exotic forest planting (i.e. it would directly address Problem 2). New ETS forestry would be quantitatively limited to X hectares of new forest per year (X to be determined, based on expected CO2 tonnage/ha rates, to approximate a targeted profile of the policymaker's limit on new removal units).

By limiting new ETS forests, this option would also prioritise gross emissions (i.e. address Problem 1) and indeed would even allow policy makers to dictate the exact numerical relationship between reduction units and removal units over time if required. This is because:

- New forestry into the ETS would be quantitatively managed;
- Existing ETS forestry is a known, and
- The number of auction NZUs to be made available are a quantitative policy variable.

Hence, policy-makers could use this option to explicitly manage the amount and type of exotic forestry planting, and explicitly determine the relationship between the number of reduction units and the number of removals units in the ETS going forward. This would enable Problem 1 to be directly addressed in addition to directly addressing Problem 2.

The management of new exotic forests in the ETS could take various forms, depending on wider policy objectives. The overall number of hectares targeted or allowed in any given time period would be set with regards to Objective 1. However specific rules could be set to target plantings on marginal land, to promote biodiversity ahead of monocultural plantings, to

restrict plantings on Highly Productive Land (HPL), to distinguish by land ownership, and so on.

Given that the ability of a forest to enter the ETS could become a scarce resource, there would need to be a way to allocate that scarce resource. This could be by way of auction, with proceeds contributing to an environmental fund. Alternatively, and perhaps preferably, it could be based on a priority weighting (scoring system) where the most suitable land (e.g. marginal, erodible) was preferred. Other mechanisms would also be possible.

We note that MfE's concerns as described in the consultation document and illustrated in Figure 4 are less to do with the *current* number of removal NZUs in circulation, but rather with the large number of removal NZUs that are *forecast to be in circulation in future years* under current policy settings. We believe therefore that Option 5 could be effective in directly addressing Problem 1.

This Option 5 would not alter the number of existing removal NZUs in circulation, but would place a limit on the number of new removal NZUs that could enter the ETS in the future.

Step 4: Evaluation of the options from Step 3 against the criteria from Step 2

We believe it is logical that this additional option be considered.

We also believe that if evaluated against the criteria we believe are most important, listed above, this option could perform very well and potentially score ahead of Options 1-4 set out in the consultation document.

Regarding *effectiveness*, we believe it would score highly because this option directly addresses the problem situation as defined, and specifically the two key problems identified with the status quo. The quantity and basis for new removal NZUs would be directly controlled, as would the proportion of removal vs. reduction NZUs issued.

By way of contrast, Option 4 of the consultation paper relies on a price signal (not direct quantity control) to achieve the desired quantity outcome. This is an extra (indirect) step, where a price signal – such as the removal-only NZU price suggested in the consultation paper – is set at a level in the hope of achieving a desired quantity outcome. But it could be too high, or too low. Directly managing the quantity outcome is far more effective than relying on an indirect approach where the price is managed instead and the market is relied upon to respond in order to deliver a quantity that might or might not match the policy intention.

Regarding *efficiency*, we believe Option 5 would score highly because it would tend to avoid unintended consequences that could exist in each of Options 1 through 4. Further, by retaining a single NZU commodity, with a single price, is should be expected that there will be greater clarity as to what an NZU is, there will be a deeper and more liquid market for NZUs, NZUs will be more consistent with their international peers and there will be no new gaming opportunities that might otherwise have been created by defining what is effectively two classes of NZU. Each of these factors will contribute to the efficiency of the NZU market, and ultimately to the efficiency with which New Zealand meets its climate change objectives.

Option 5 also has the significant advantage of preserving maximum regulatory certainty. It is essentially a modest change to the existing regulatory arrangements, restricting new entry of one class of market participants, but not fundamentally changing the overall system. The value of regulatory certainty can not be overstated, and efficiency is directly related to the level of regulatory certainty achieved.

Regarding non-discrimination, we believe Option 5 would score highly because it would not discriminate among market participants as Options 3 and 4, in particular, would. All existing ETS market participants (today) entered the market on the same basis and with the same understanding of being treated on a non-discriminatory basis. The idea that existing holders of NZUs could be discriminated against on the basis on how their existing holdings of NZUs were originated (e.g. auction vs. forestry) would be the antithesis to the principle non-discrimination.

Conclusion

We urge MfE to do two things:

1. Consider a new Option 5, which would involve direct management of the amount of new exotic forest planting allowed to enter the ETS, and by way of this management would allow direct control of the ratio of reduction NZUs vs. removal NZUs eligible to enter the ETS.
2. Utilise three over-arching criteria when evaluating all options, including this new Option 5. These criteria are *effectiveness*, *efficiency* and *non-discrimination*.

We believe that the new Option 5 is worthy of full consideration and is likely to be the best option when evaluated on these criteria.

Hamish Fraser

Director

[redacted]

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11 August 2023

To: Ministry for the Environment
PO Box 10362
Wellington 6143

Email: etsconsultation@mfe.govt.nz

Subject: A review of the New Zealand Emissions Trading Scheme

Submission from: Ruapehu District Council
Private Bag 1001
TAUMARUNUI 3964

Point of Contact: Melissa Jackson
Manager Policy & Strategy

Email: [redacted]
Phone: [redacted]

Council does not wish to speak in support of its submission.

Acknowledgement

Ruapehu District Council (RDC) thanks the Ministry for the Environment for the opportunity to submit in relation to the review of the New Zealand Emissions Trading Scheme (ETS).

About Us

The Ruapehu District (the District) is a land-locked area covering 6,733km², with a usual resident population of 12,309 (Statistics NZ, Census 2018). Ruapehu is one of New Zealand's largest districts by land area, however, has a relatively small and dispersed population base with one of the lowest resident population densities in the country (0.02 persons per hectare). The Ruapehu District has high levels of socio-economic deprivation compared to other parts of the country.

The Ruapehu District has a strong primary industry sector. It is also a growing tourist destination and enjoys a significant and steadily increasing number of visitors and non-permanent residents each year. The Ruapehu District receives approximately 1.2 million visitors annually, and although the district's usual resident population is lower, the population goes up to approximately 28,000 on our peak day.

Introduction

RDC recognises that forests play an important role in New Zealand's response to the climate change emergency. Forests play a significant role in RDC's local economy, rural communities and to Māori, both culturally and economically. RDC agrees that it is important that the NZ ETS incentivises emissions removals to meet climate targets but wants to ensure that the type and scale of the resulting afforestation is balanced. RDC also recognises the opportunities the ETS presents to climate change objectives (mitigation and adaption) and to support Māori in their aspirations on their whenua.

The District has seen substantial increased investment in exotic forestry due to significant carbon value increase. RDC is concerned that without changes and oversight, large-scale land use changes resulting from whole farms converting to forestry, will continue to remove productive farms from the Ruapehu economy and threaten the social fabric of small rural communities. Employment opportunities for our rangatahi will decrease substantially and result in lasting impacts economically and socially in our rural community.

RDC is concerned that offsetting emissions is not changing emission reduction behaviour and is counterproductive to climate related goals and targets. RDC would lie to see more emphasis on incentivising emission reduction then offsetting.

2.1. Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

RDC agrees that the existing supply–demand dynamic of the NZ ETS is unlikely to be sustainable in the long term.

2.2. Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

No specific evidence to share at this time.

2.3. Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?

In response to the significant increase in carbon price the Ruapehu District has seen greater investment in exotic forestry. Productive farms are being purchased to be converted to carbon farms. RDC is concerned that without review and improved oversight large scale land use changes may have lasting impacts economically, environmentally, and socially on our rural community.

RDC is concerned that without review and oversight, these large-scale land use changes will continue to remove productive farms from the Ruapehu economy and threaten the social fabric of small rural communities. Employment opportunities for our rangatahi will decrease substantially and result in lasting impacts economically and socially in our rural community.

2.4. Do you agree with the summary of the impacts of exotic afforestation?

Yes.

Please explain your answer.

While RDC understands that forestry is essential in our response to climate change, concern remains that the land-use change in response to the ETS will result in broader social, economic, and environmental impacts in the Ruapehu District's communities. RDC supports forestry that delivers co-benefits, such as focusing on native biodiversity and the integration of trees within farms rather than large-scale plantation forestry. RDC supports Māori aspirations and tino rangatiratanga on their whenua. RDC acknowledges that Māori freehold and Māori customary land is often disproportionately on remote, less versatile land that can be well suited to forestry.

3.1. Do you agree with the case for driving gross emissions reductions through the NZ ETS?

Unsure.

Please explain your answer. In your answer, please provide information on the costs of emissions reductions.

RDC agrees that driving gross emissions reductions through the NZ ETS could decrease cumulative emissions helping NZ reach future climate targets in the long term. RDC is concerned, however, that the district could be disproportionally impacted by this decision both economically and socially.

Industries highly reliant on energy, fuel and transport costs and thereby identified as high-emitting businesses are usually located in the Regions, including the Ruapehu District. The District has a strong primary industry vital to the District's economy. RDC acknowledges the fact that as the industrial allocation of free NZU's is phased out, high prices could increase the risk of these becoming uncompetitive and moving overseas (described in the discussion document as carbon leakage), which would achieve no benefit for the climate and impact the regions disproportionally through more significant economic and employment impacts. RDC wants to ensure these businesses have the time and technology to transition successfully to a low-emission model. RDC looks forward to the government's investigation of long-term options to address emissions leakage.

RDC identifies that by using the NZ ETS to drive emissions reductions, the Ruapehu District will be disproportionally affected by the increasing household costs, including transport and energy costs which could negatively impact households. The modelling provided as part of the review suggests

low-income households could be disproportionally affected through exposure to the rising cost of living due to the NZ ETS. Modelling shows that emission expenditure as a share of household income is significantly higher for low-income households, and lower-income households tend to spend a more significant percentage of their income on products and services affected by emissions prices, further exacerbated due to the need for many households in our District having to travel for work, school and health reasons. The District has a higher Māori population of 43.4% compared to the New Zealand average of 17.4%. Māori are disproportionately represented in lower-income groups. The District is identified as an area of very high Deprivation; Deprivation is a state of observable and demonstrable disadvantage relative to the local community or nation to which an individual, family or group belongs consisting of material and social aspects, including low-income households. Therefore, RDC supports the need for targeted mitigation to address the regressive effects of emissions pricing, including other regulatory and funding mechanisms outside the ETS to mitigate these significant challenges.

3.2. Do you agree with our assessment of the cost impacts of a higher emissions price?

Yes.

Please explain here.

RDC agrees that driving gross emissions reductions through the NZ ETS could decrease cumulative emissions however careful balance and mitigations need to be included in decisions to avoid disproportionate negative outcomes on the Regions, businesses and households, particularly low-income households, and to prevent carbon leakage.

3.3. How important do you think it is that we maintain incentives for removals?

RDC acknowledges that incentives for removals must be maintained to meet New Zealand's international and domestic climate targets and budgets and give industries with hard-to-abate emissions time to transition to low-emission models.

4.1. Do you agree with the description of the different interests Māori have in the NZ ETS review?

Yes.

Please explain here.

RDC agrees with the importance of embedding Te Tiriti in the Crown's climate response. RDC agrees that the impact of the NZ ETS review on forestry opportunities will be particularly relevant to Māori. As rangatira, kaitiaki, land and forest owners, rural communities, workers, business owners and whānau subject to rising living costs, Māori have a specific interest in changes to the design and operation of the NZ ETS.

4.2. What other interests do you think are important? What has been missed?

RDC supports Māori aspirations and tino rangatiratanga on their whenua and understands that forests are important to Māori both culturally and economically. RDC acknowledges that Māori freehold and Māori customary land is often disproportionately on remote, less versatile land that can be well suited to forestry. RDC understands that there will be a significant financial impact on some

Māori businesses because of changes suggested in the ETS review, and these financial impacts need to be managed appropriately.

4.3. How should these interests be balanced against one another or prioritised, or both?

To achieve an equitable transition for Māori, the Government needs to:

(a) Prioritise Māori interests.
(b) Reduce existing barriers to Māori participation.
(c) Avoid creating new inequities in its climate response.
(d) Include Māori perspective, knowledge, and aspirations in shaping the ETS and the decision-making process.

4.4. What opportunities for Māori do you see in the NZ ETS review?

RDC recognises sustainable economic development opportunities that could contribute to job creation, investment, and community development. Māori values, practices and knowledge can be integrated into the NZ ETS review, including traditional ecological knowledge, indigenous biodiversity, and protection of wāhi tapu sites.

If any, how could these be realised? Please explain your answer.

A commitment to fulfilling opportunities for Māori through the ETS review, including ongoing engagement and the flexibility to adapt to evolving needs, technology and aspirations.

5.1. Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals?

Yes.

5.2. Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow?

Yes.

5.3. Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term?

Yes.

5.3. Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term?

Yes.

5.5. Are there any additional criteria or considerations that should be taken into account?

RDC does not have any additional comments at this time.

Chapter 6: Options identification and analysis

6.1. Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

RDC would require further information and advice to comment on this question, as implications of all the options and their combinations are broad and involve positives and negatives factors within each option. RDC looks forward to further consultation on these options.

6.3. Of the four options proposed, which one do you prefer?

RDC Would require further information and advice to comment.

6.4. Are there any additional options that you believe the review should consider? Why?

RDC Would require further information and advice to comment.

6.5. Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

RDC Would require further information and advice to comment.

6.6. Do you agree with the assessment of how the different options might impact Māori?

RDC Would require further information and advice to comment.

7. Broader environmental outcomes and removal activities

7.1. Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation?

Unsure.

Please explain here.

RDC supports increasing the levels of indigenous afforestation through incentivisation but agrees that on the modelling provided, enabling investment in indigenous forests to be profitable and comparable in profitability to exotic forests will likely require further supporting policy beyond the NZ ETS. RDC recognises opportunities to increase indigenous forests through transition forests and supports continued research in this area.

7.2. If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

RDC would need more information before commenting, as all options have positive and negative implications.

7.3. Should a wider range of removals be included in the NZ ETS?

Yes.

Please explain here.

RDC supports consideration of recognising a wider range of forms of sequestration such as pre-1990 natives and wetlands (either through the ETS or other mechanisms) and valuing these types of sequestration, as they also deliver wider environmental outcomes, such as biodiversity.

7.4. What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

RDC would require more information and advice to comment.

To Ministry for the Environment.

Submission on **Review of the New Zealand Emissions Trading Scheme.**

By [redacted]

Contact email [redacted]

Basis Individual as a private forest owner since 1986.

Region Live in Hawkes Bay but own forests which are in the lower North Island.

Linkages Member: New Zealand Farm Forestry Association, New Zealand Institute of Forestry, Forestry Australia.

Forestry graduate: University of Canterbury (1982), Oregon State University (1991).

1. Purpose.

The Reviews stated purpose is to reduce climate pollution at source whilst also supporting greenhouse gas removals.

My purpose is to generally support the Reviews purpose with suggestions learnt from the past whilst trying to chart a sensible path for the future.

2. New Zealand Emissions Trading Scheme (NZETS) from Inception to Now.

The NZ ETS implementation has been haphazard, patchy and disappointing to date for several reasons, such as:

1. It failed to get agriculture "on board" despite repeated published entry dates that extended or vanished as they became closer. The result was a lack of confidence in the ETS, those administering it and the New Zealand Government as it appeared insincere and susceptible to political manipulation.
2. Eastern European Units were introduced to the New Zealand carbon trading market resulting in a price crash of approximately $25.00/NZU to $0.12/NZU[1]. Some European Units were bogus but the damage was done. New Zealand Government's credibility suffered as it appeared gullible and naïve with regard to European Units. It took a long time for New Zealand Units value to recover.
3. Government disregarding Climate Change Commission advice on NZU prices until challenged by lawyers in Court. Haphazard NZU market manipulation in the face of adverse economics for constituent voters to enhance political prospects in an election year does little to reinforce governments sincerity to climate change or give confidence in the ETS long term.

Items 1 – 3, above, undermine the NZETS, its intent, its integrity, its plausibility, its viability and lessen investors willingness to participate in reducing climate pollution.

Forestry[2] is a long-term business concerned with managing a forest environment. Too much emphasis is placed on exotic forestry for commercial gain and not enough for soil conservation, wildlife habitat, indigenous forestry and wider environmental considerations such as climate change. This statement

[1] NZU – New Zealand Unit.

[2] Forestry is defined as management of both indigenous and exotic forests and the ecosystems and environments within and about these.

predominates in New Zealand, more so since the abolition of the original New Zealand Forest Service (NZFS) in 1987. The NZFS splitting into the New Zealand Forestry Corporation, Department of Conservation, the Ministry of Forestry, and eventually, National Rural Fire Authority resulted in segmentation of roles, the sector and public perceptions. It also resulted in changed land use management objectives; such as:

A. Changed land uses. Some "protection forests", designed to conserve soil[3] etc, were felled for profit when State Forests were sold to private investors. For example: Mangatu Forest and Rip Forest in Gisborne District.
B. Department of Conservation struggled with funding having lost the cross subsidies from NZFS's exotic forestry funds post 1987. Indigenous forest and indigenous wildlife management suffered as a consequence.
C. Wildfires were not managed as well as when NZFS had Regulatory Authority over this function. There was no Regulator for several years. Standards slipped. A fire in Dunsandel indirectly resulted in the formation of the National Rural Fire Authority. Fire management improved.

Under financial pressure, the New Zealand Government sold off State owned assets (such as exotic forests), removed Regulatory oversight which resulted in lesser environmental outcomes until alternative measures were put in place. This has a flow on effect to the ETS even now and makes others and me wary.

3. ETS synergies with other Land Uses.

New Zealand has a problem with climate change,

- very heavy rainfalls causing flooding and erosion,
- elevated temperatures for longer resulting in droughts, lost plant and animal production, increased fire risk and fire loss,
- some crops becoming uneconomic due to environmental fluctuation and increasing pest presence,
- infrastructure that has proven flimsy, prone to breakage and in need of upgrading,
- cost of reinstating one-time productive land and dealing with peoples suffering that arose.

Indigenous vegetation planting on class 7 and 8 lands is entirely sensible on a macro scale but is resisted by some pastoralists in some parts of New Zealand. Soil stabilization, employment, carbon sequestration and eliminating that land from extensive grazing all go hand in hand. If we fail as a people in this, we will eventually farm rocks and civilisation as we know it will fail on a grand scale.

Even in areas of permanent indigenous forest, there can be large slips to bare rock on steep lands bisected with earthquake fault lines. The Eastern Hutt water supply catchment has examples.

The concept of plating indigenous vegetation on erosion prone lands needs serious and strong consideration, backed up with large scale targets, action plans and the resources to implement it.

[3] "Catchment Control in New Zealand". A.L. Poole. Water and Soil Misc. Pub. No. 48. Ministry of Works and Development, Wellington. Pg 69. 1983.
"The Story of Mangatu the forest which healed the land". F. Allsop. New Zealand Forest Service Information Series No 62. AP Thompson Director General of Forests. Wellington. 100 pp. 1973.

4. Farmers Prevarication in Entering the ETS.

Farmers prevarication in entering the ETS results in;

1. Adverse application of ETS advantages to farmers, versus the disadvantages of being in the ETS to others, such as forest owners, who are stuck with costs of compliance and NZU manipulation.
2. Skewing land prices up where the ETS does not apply. E.g. dairy land.
3. Less credibility for NZ offshore when we are seen not to pull our weight.
4. Jeopardising future market sales when NZ produce is not deemed as produced within the spirit of the ETS or an emissions reducing environment.
5. An artificially inflated income, for farmers and the country, as it is produced on the strength of environmental livestock pollution (CO_2 and CH_4.)
6. An inevitable financial crash when NZ's non ETS compliance is rejected by affluent world markets. E.g. meat and dairy products rejected or incur tariff penalties.

Implementing the ETS will continue to be politically unpalatable but ultimately necessary in some form due to external pressure beyond the farm gate. Impacts will be felt harshly for some farmers and declines in national GDP and living standard should be expected until substitute land uses or income streams are found. A multi-party approach would be most sensible, but likely not achievable until its almost too late.

5. Commentary on Options.

Option 1

Decrease the amount of emissions units so that the carbon price rises.

Comment. ***I favour this option.*** *It will drive polluters to seek alternative technologies and give greater recognition to the role played by farm animals so that they are no longer "carried" by others in the economy. The cost of their pollution will be too great to ignore and they will be forced to adapt.*

Option 2

Increase the demand for emissions units by allowing the Government and/or overseas buyers to purchase them.

Comment. ***Not favoured.*** *The Government is not to be trusted with funds long term as it is too influenced by its own immediate issues (elections, bankruptcy, sector favouritism, regional development projects). If Government was a buyer, I fear that it would manipulate prices, or taxes, to ensure things were in its favour and not act with long term integrity.*

Option 3

Restrictions or conditions are placed on removal activities

Comment. ***Not favoured.*** *This option has the potential to be messy. It could be used as a tool for "regional development" (in specific vulnerable electorates[4]) or, to ensure that certain people are compensated for perceived past injustices. E.g., Corporate tax rate of 17.5% on profits versus 28% for the rest of us, as happens with some Iwi enterprises now.*

Option 4

Emitters will not be able to purchase NZUs from foresters to pay for their greenhouse gas emissions

Comment. ***Not favoured.*** *The Government could manipulate prices by discounting NZUs' for some and ensuring others pay "market rates". Alternative manipulations could occur with the Government waiving "administrative charges" for some, or "subsidising an NZU acquisition", for others and making everyone else pay full price. Priority NZU allocations could be made to certain groups, ahead of others as an economic booster[5], payment in lieu of land or Treaty settlement costs etc.*

The New Zealand Government is better off out of this option in my view as it has proven several times in my lifetime that it "interferes" in various markets. (Robert Muldoon was a major economic interventionist – MRP[6] et.al. Grant Robertson, ditto.)

6. Commentary on Other Considerations for Review.

As part of the review, the Government will also consider whether the NZ ETS should be changed to:

- improve incentives for native forests
- examine additional types of carbon removals such as from wetlands or direct air carbon capture.

While a higher carbon price leads to faster emissions reductions, it is likely to have a knock-on effect of higher prices for goods and petrol.

The Government recognises the potential impacts of higher carbon prices, particular on lower-income families. Strategies for supporting a fair transition are included in the Government's emissions reduction plan.

The Government has heard that more urgent climate action is required. Māori communities are disproportionately vulnerable and already facing the impacts of climate change. Māori also have significant interests in forestry land.

Improving Incentives for Native Forests.
The ETS should be left alone as an incentive to plant native forests, i.e., unmodified.

Native forests planting should be encouraged independently however. This should be on the basis that native forests need to become "established" and not just planted. By this I mean, a person or organisation needs to ensure that the native forest gets through the following; planting shock, drought,

[4] "Provincial Growth Fund" targeted to Northland.
[5] $640 M of Provincial Growth Funding over which Government Agencies have poor visibility. (A handout?)
[6] MRP. Maximum Retail Price scheme. This was imposed on most grocery and household items.

livestock and pest damage, fungal / insect infestations, fire, weed competition, and mismanagement from humans – aerial sprays. This "establishment phase" could take up to five years and grazing still not be allowed during or after that.

Planting focus should be on Class 8 and 7 country, and soil parent materials of mudstones, siltstones, sandstones, unconsolidated gravels, sand, and sites subject to wind erosion.

Native (Indigenous) forests could be developed by:

a) Spreading seed mixes of local forest species from the air. (Low cost, less successful establishment. May have to wait several years before results are obvious.)
b) Planting bird attracting species and allowing visiting birds to spread seed naturally in droppings. (Lower cost but dependant on bird attracting species doing just that, and birds being present. Slow establishment.)
c) Planting up tracts of land with labour or machinery on less steep land. (Expensive, labour intensive, seedlings required to be grown and transported etc.)
d) Retiring tracts of ground, keeping livestock and feral animals out, shoot same if present. (Least expensive development, slowest, slow on infertile – weed infested and dry ground.)

All the above options would require pest control for hares, rabbits, possums, goats, pigs and deer etc. Some humans wish to burn patches of native bush on fertile yet less visible ground to encourage wild animal browsing for hunting. This practice would have to stop. It is a difficult requirement on Māori land as many Māori like eating game animals and love to hunt for food and sport. (A compromised objective.)

People on "Jobseeker" benefits could be enticed to propagate vegetation, plant trees, deal with pest control or release trees from competing scrub. If they did not, they could lose their benefit. Such schemes worked to a degree in the past with motivated PEP[7] and TEP workers in the 1980's.

Prison inmates could do the same type of work, and have where they were responsible.

Examine additional types of carbon removals such as from wetlands or direct air carbon capture.
Photosynthesis is the most widespread means of carbon (CO_2) capture on the planet. Some plants are more efficient at photosynthesising (C_4) than others. (Sugar cane, maize, sorghum for e.g.) If NZ wants to quickly and efficiently remove atmospheric carbon, then it needs to plant vegetation that captures CO_2 as easily and as efficiently as possible. Maize is suited to this but requires fertile soils, adequate water and shelter from wind. Sugar cane would perfume even better but is not a good choice for New Zealand and is more suited to Queensland and Fiji.

Less photosynthetically efficient plants (C_3), such as those listed below, will suit New Zealand in many ways and many are already planted. The country has to be realistic in terms of using its soils, water and climate within the range of possibilities rather than dealing in unrealistic endeavours.

Wheat, oats, barley, cotton, peanuts, sugar beet, soybeans, spinach, tobacco, lucerne, rye, fescue, sunflower, potatoes, eucalypts, most trees.

[7] PEP – Project Employment Program workers. TEP – Temporary Employment Program workers.

I do not know enough about wetlands and their abilities to fix carbon in any quantity to make comment.

7. Māori land and Activities in the NZ ETS.

Māori have made very good investments in forest land developments generally south of Taupo and in the Gisborne District. Ngāti Tūwharetoa and Ngāti Porou have both used their lands wisely in significant forest developments for the benefit of their people and the wider community. Tūwharetoa are established longer and used a forest management company - which they bought out. Ex New Zealand Forest Service staff (<1987) were key to the developments.

I view both projects as successful and see no reason why further developments by other Iwi, using skilled forest managers, could not take place across New Zealand.

I favour manuka planting for honey production less because manuka is not a dominant tree, is early in a plant succession and will ultimately be overtopped by more dominant vegetation after a few decades. Manuka is at best a "nurse" crop to shelter other native species development.

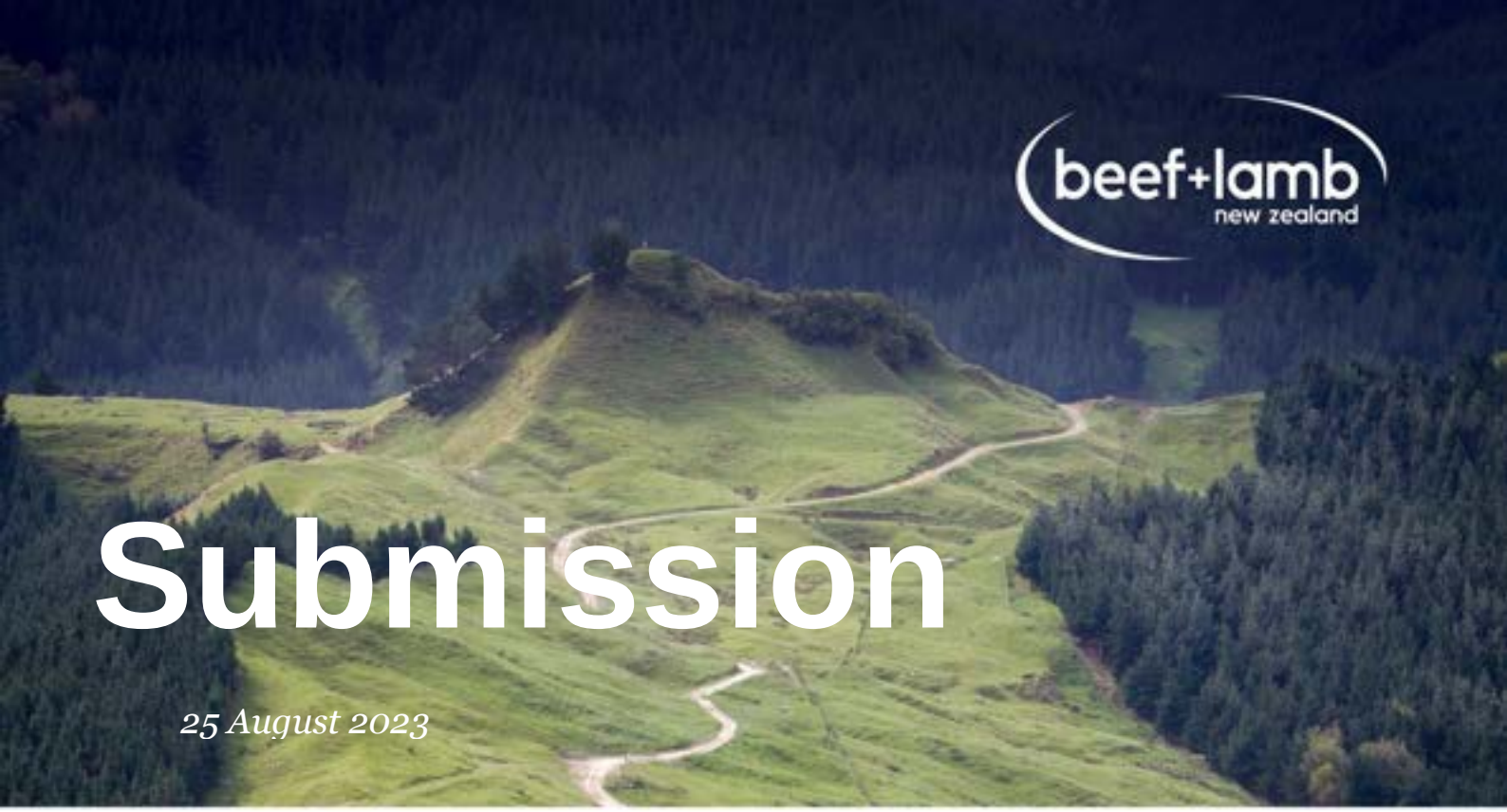
Incentives to plant up more Māori land could be:

a) Work for the dole schemes to get planting done on a piece rate. That is, plant 1000 trees per day, at the correct spacing, or payment is cut accordingly.
b) Tax offsets so that profits from a very large incorporation are ploughed back into forest land development. This could be partnerships between Iwi, or one Iwi and other "external" shareholders. (E.g. Ngāti Porou – Hansol Joint Venture.) There are a wide range of possibilities.
c) Use "at risk energetic youth" under the mentorship of a sound, sensible and fit older Māori bushman to do the planting and forest tending. This is better than youth detention or jail.
d) Contractors engaged over planting seasons for establishment and supported by permanent staff. This could be achieved by a "Forest Encouragement Loan" as existed in the 1980's and drawings were charged at a commercial interest rate.

I would not favour any Māori "specific" scheme as I feel that any Government funding should be open to **all** New Zealanders. To do otherwise is separate development when I have witnessed very successful Māori forest owners and business people in numerous enterprises.

[redacted]

10th of August 2023.



Submission

25 August 2023

TO

Ministry for the Environment and Ministries for Primary Industries

ON THE

"THE REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME" AND

"A REDESIGNED NZ ETS PERMANENT FOREST CATEGORY" CONSULTATIONS

BY

Beef + Lamb New Zealand Ltd

SUBMISSION ON "THE REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME" AND "A REDESIGNED NZ ETS PERMANENT FOREST CATEGORY" CONSULTATIONS

To the: Ministry for the Environment and Ministries for Primary Industries

Email: etsconsultation@mfe.govt.nz and NaturalResourcesPol@mpi.govt.nz

Name of Submitter: Beef + Lamb New Zealand Limited (B+LNZ)

Date: 25th August 2023

Address for service:

Name	Position	Phone Number	Email Address
Madeline Hall	Senior Environment Policy Analyst	[redacted]	[redacted]
Dave Harrison	GM Policy and Trade	[redacted]	[redacted]

Executive summary

Beef + Lamb New Zealand (B+LNZ) welcomes the Government's review of the New Zealand Emission Trading Scheme (NZ ETS), its treatment of forestry offsets, and the conditions for 'permanent' carbon forests.

B+LNZ firmly supports the need for these reviews. New Zealand's current use of offsets is catalysing negative social and economic impacts for our rural communities and national economy for the benefit of fossil fuel intensive industries and activities. Settings are not supporting New Zealand's effective transition to a low-emissions economy or increasing our resilience to a warmer world that comes with compounding challenges including food security.

The full inclusion of forestry offsets within the NZ ETS is almost unique internationally, with New Zealand's offsetting policies in stark contrast to other countries. We are one of only two nations (the other being Kazakhstan) globally that allow emitters to meet their emissions obligations in an Emissions Trading Scheme using 100% forestry offsets rather than actually having to reduce our greenhouse gases (GHG).[1]

Forestry offsets should not be used in the place of real cuts to long-lived gas emissions, especially when they impact food production, and have a negative impact on the social and economic wellbeing of the rural community and national economy. The current settings in the NZ ETS must change.

The NZ ETS is an instrument to be utilised based on the objectives the Government, and wider New Zealand, set for it. We believe that any changes to the treatment of forestry within the NZ ETS need to be underpinned by a clear direction for the future. Both on the intended use of forestry offsets to meet domestic and international emissions reductions targets as well as how these offsets are intended to provide co-benefits for our natural world and rural communities.

We support changes to the NZ ETS, along with other policy mechanisms and tools, to ensure emitters reduce their emissions first, and have access to offsets only for hard to reduce emissions. Additionally, any changes must support forest integration within farming systems that can allow for significant co-benefits. Our farmers are not getting fair recognition of their stewardship work supporting biodiversity, erosion control, or shade and shelter provision within integrated landscapes and farming systems. It's critical that the government move rapidly to put in place mechanisms to reward this work.

We support further analysis on Options 3 and 4 identified in the discussion document as these options can best control the use of forestry offsets and be leveraged to provide co-benefits. We do not believe that Options 1 or 2 will manage the problems we see, and are likely to make it more challenging to reduce emissions effectively. We support changes to the Permanent Forest Sink category to restrict the entrance of exotic forests, change the carbon accumulation method for 'transition' forests, and to set minimum management standards for all participants. We support the inclusion of alternative vegetation types in the NZ ETS but are unsure as to whether the NZ ETS is the best tool to recognise and reward alternative carbon removals, or the wider nature-based solutions, that on-farm vegetation can provide.

[1] See here for further information: https://beeflambnz.com/sites/default/files/news-docs/ETS-summary-report-2023.pdf

2. Our context:

B+LNZ is an industry-good body funded under the Commodity Levies Act 1990, through a levy paid on all cattle and sheep slaughtered in New Zealand (except bobby calves). B+LNZ represents sheep and beef levy-payers and has the mandate to submit on their behalf on matters that affect them. In all, we represent around 9,000 commercial farming businesses with red-meat interests located across the country.

B+LNZ is actively engaged in supporting farmers' environmental management, with a particular emphasis on building farmers' capability and capacity to support an ethos of environmental stewardship, as part of a vibrant, resilient, and profitable sector based around thriving communities. Protecting and enhancing New Zealand's natural capital and economic opportunities and the ecosystem services they provide is fundamental to the sustainability of the sector and to New Zealand's wellbeing for current and future generations.

The sheep and beef sector is essential to maintaining rural communities and their cultural, societal, and environmental wellbeing, as well as contributing to the country's economic wellbeing. For the year ending 31 December 2022 the red meat industry contributed $11.4 billion to New Zealand's export revenue; making the sector New Zealand's second largest goods exporter. As New Zealand's largest manufacturing sector, it supports over 92,000 jobs (35,700 directly and an additional 56,700 indirectly employed).

Just under a third of New Zealand's total land area is used for sheep and beef (mixed agriculture), comprising about three quarters of pastoral lands. Sheep and beef farmers are significant stewards of native vegetation, managing approximately 2.8 million hectares of native habitat, including 1.4 million hectares of native forest. This is the second largest holding of native forest and native biodiversity in the country and represents almost 25 percent of New Zealand's remaining native vegetation.

Additionally, an estimated 180,000 hectares of exotic forest rests on sheep and beef farms. This mix of native and exotic woody vegetation sequesters a significant amount of carbon, with estimates varying from 5.5 Mt CO2-e (Ministry for the Environment) to 10.4 – 19.7 Mt CO2-e (AUT).[2]

The sheep and beef sector understands the importance of keeping global temperature rise within prescribed limits. It is critical to the wellbeing of New Zealand, our children, and the world as we currently know it. As stewards of the land and the natural resources, sheep and beef farmers are at the forefront of the impacts of climate change. Farmers are already seeing and experiencing these changes and are continually adapting their management practices and will continue to do so.

[2] For context, the GHG inventory for 2021 estimated that the total removals across the country were 21.1 Mt CO2-e. https://environment.govt.nz/assets/Publications/Files/Net-emissions-and-removals-from-vegetation-and-soils-on-sheep-and-beef-farmland.pdf and https://beeflambnz.com/net-carbon-report

Sheep and beef farmers are playing their part in the actions needed to achieve the Paris Agreement with our sector's gross methane emissions reducing by approximately 1 percent annually since 1990 with sheep meat being assessed as carbon negative.[3]

Most recently as part of our commitments to the He Waka Eke Noa Partnership, we developed a GHG calculator and ran over 300 extension events to help farmers understand their on-farm emissions. Over 95 percent of New Zealand's 9,165 commercial sheep and beef farmers now know their gross emissions numbers and 55 percent have a plan to manage them.

NZ ETS settings have been a significant catalyst in recent land use changes across the country. As a result, there has been a 9 percent decline in sheep stock units (su) since 2017-18.[4] Although this supports New Zealand to meet its domestic emissions reduction targets and Paris Agreement contributions, our farmers are feeling disproportionately impacted and in no way feel that recent land use change is part of a 'just' transition.

Recent government announcements to charge farmers for emissions regardless of progress towards emissions reductions targets (or considering the true warming impact of ruminant emissions) is disappointing. More recent research[5] using the latest climate change science indicates that the sheep and beef sector is very close to warming neutral. It is critical that government climate change policies and mechanisms do not work against those industries, communities and individuals that are working towards and delivering New Zealand's climate objective.

[3] See summary of sheep and beef numbers since 1990 here: https://www.stats.govt.nz/indicators/livestock-numbers See summary of lifecycle analysis of sheep and beef meat here: https://beeflambnz.com/knowledge-hub/PDF/summary-study-carbon-footprint-new-zealand-sheepmeat-and-beef.pdf and See a peer reviewed report on the industry's carbon footprint here: https://www.sciencedirect.com/science/article/pii/S0195925522002128?fbclid=IwAR2wnm9A_Uj-uHxq8cyW-Si_58GnuOtvhgpTGd4Vj0nI4hA4NNI6f54XepA

[4] Note: In this period beef cattle su increased 8.3% offsetting much of the sheep decline.

[5] This research has been submitted to the Climate Change Commission as part of their evidence to inform a potential review of the emissions reduction targets. We will be releasing it more publicly in the coming months.

Submission structure:

Our submission is made in a number of parts.

1. Our views summarised in an Executive Summary
2. Some context about our industry (see above).
3. The current problems we see with the ETS settings (particularly offsetting) and how these are catalysing land use change with significant impacts on rural communities and New Zealand's economy.
4. A better approach for forestry offsets and what changes could be.to deliver on this
5. Detailed responses to the consultation document questions for the NZ ETS review.
6. Feedback on the Permanent Forest Category changes.

Our submission is supported by a number of attached appendices including:

- Appendix 1: Analysis on the impact of afforestation on stock units and export returns.
- Appendix 2: A summary of Sheep and Beef Farmers' responses to a range of questions posed at the beginning of the consultation period.
- Appendix 3: A draft set of principles to inform policy setting changes.
- Appendix 4: An external analysis and justification for change completed by Meredith Connell.

3. Current problems we see:

- Our landscapes are changing:

There has been a rapid change in land use from sheep and beef pastoral farming to carbon forestry as a direct result of increasing carbon prices, which has impacted the short to -medium term profitability per hectare of different land uses. Additionally, exotic carbon forestry now outperforms many other land uses in the short-term, particularly sheep and beef production. This means that current sheep and beef farmers, landowners, and/or investors are either:

a. Selling their land to forestry and/or carbon forestry investors,
b. Choosing to change their land uses into forestry and/or carbon forestry or,
c. Maintaining their current land uses (e.g. in sheep and beef farming).

Based on the incentives provided by high carbon prices, new tree planting is progressing at a rate that far exceeds what New Zealand would need to meet its domestic emissions reductions targets (as recommended by the Climate Change Commission (CCC). Current policy settings are doing little to encourage actual emissions reduction for long-lived gases. We agree with officials that the core task as a result is to find a way to encourage emissions reductions and better manage the use of emissions removals.

Previously, preferential arrangements under New Zealand's overseas investment regime streamlined foreign investment through the 'special forestry test' and increased the amount of land bought by overseas investors who can benefit from the sale of wood products and carbon units. Although this pathway has been closed, impacts of this policy are continuing to be felt as significant land tracts are still being sold to overseas investors given earlier permissions. Based on our estimates, this special forestry test has allowed for over 77,000ha of sheep and beef land to be bought to date by foreign interests, representing 37% of conversions from sheep and beef to forestry between 2017 and 2022.[6]

The current rate and pace of land use change is driven by short-term profitability drivers with potentially long-term consequences. Based on analysis by the B+LNZ economic service, the potential return on a per hectare basis over a 30yr period is nearly 2.6x greater for carbon forestry than sheep and beef and 4.7x greater than forestry alone.[7] This has led to over 210,000ha of sheep and beef land being bought and then converted into some form of forestry (plantation, manuka, carbon etc.) since 2017 with carbon units as a key driver for investment.[8] Although carbon offsets and forests undoubtably have a role to play in our transition to a low-emissions nation, the current policy settings are driving unmanaged land use change with

[6] See: https://beeflambnz.com/sites/default/files/2023-08/Afforestation-Review-2023.pdf
[7] Note that MPI indications are slightly different but still indicate significant differences between the NPV of traditional forestry, sheep and beef farming, and business models that have carbon included.
[8] See most recent Orme and Associates summary of land bought and sold here: https://beeflambnz.com/sites/default/files/2023-08/Afforestation-Review-2023.pdf and MPI's corresponding analysis of afforestation intentions here: https://www.mpi.govt.nz/dmsdocument/57130-Afforestation-and-Deforestation-Intentions-Survey-2022 . Note that the relationship between hectares bought for afforestation, and then subsequently planted, is strong between the two research reports.

limited long-term benefits and sustained risks to our natural environment, rural community resilience, and the health of New Zealand's economy.

- ## Carbon forestry offsetting has negative consequences:

We support emissions reductions occurring within New Zealand for industries where viable technologies and solutions are available. If we do not change the way we do things, New Zealand's ability to perform on the world stage will come under threat. This is evidenced by the recent EU Trade agreement where a condition of market access is the compliance with our Paris Agreement goals. As a small exporting nation, we are reliant on the demand for our goods and services from others and this must be maintained in a warming world.

The full inclusion of forests within the NZ ETS is almost unique internationally, with New Zealand's offsetting policies in stark contrast to other countries[9] The result of current settings means there is a greater incentive for emitters to offset their emissions rather than reduce their emissions. Instead, emitters must be encouraged to reduce their emissions first, and have access to offsets only for hard to reduce emissions. The purpose of emissions offsetting is to soften the negative social, cultural, and economic consequences of meeting gross emissions reduction targets. They should not be treated as the 'low hanging fruit' in our policy toolbox, and instead be consciously considered, and be in addition to, real emissions reductions.

Carbon removal from exotic trees can last anywhere from 50-200 years while warming to the atmosphere caused by fossil fuel emissions lasts 100-1000 years. All practical options to reduce emissions at the source must be tried before relying on trees to offset fossil-based emissions.[10] Allowing for non-permanent forestry offsets, which are part of a biological not fossil carbon cycle, to offset continued emissions from fossil fuels does not ensure that our climate change policy approaches are supporting the changes required to truly reduce our emissions.[11]

B+LNZ does not believe that the full costs and impacts of large-scale farm to forestry conversions, or their limited management, is adequately considered at present. Although carbon forestry is incentivised to occur in the NZ ETS at a lower 'cost' than the uptake of novel emissions reductions technologies, the negative externalities associated with this land use change are not considered. Examples of these externalities include increased fire risk, reduced community resilience, reduced economic income to the region, and reduced export revenue into New Zealand. We note the irony that a market made the manage the externalities of fossil fuel emitting activities is creating its own set of externalities for our rural communities.

[9] Note that the only other ETS in the world that allows 100% offsetting is Kazakhstan's. See here for further information: https://beeflambnz.com/sites/default/files/news-docs/ETS-summary-report-2023.pdf

[10] This approach is strongly aligned with the most recent guidance from the Science Based Targets Initiative, the world's leading authority on private business's alignment with the Paris Agreement on Climate Change. For further information see here: https://sciencebasedtargets.org/sectors/forest-land-and-agriculture#:~:text=Key%20requirements%20of%20the%20SBTi%20FLAG%20Guidance&text=Set%20long%2Dterm%20FLAG%20science,term%20FLAG%20science%2Dbased%20targets .

[11] See report from the Parliamentary Commissioner for the Environment here: https://pce.parliament.nz/publications/farms-forests-and-fossil-fuels-the-next-great-landscape-transformation/

Over-relying on the use of forestry offsets to meet our targets, especially with using unmanaged exotics in a 'plant and walk away' style, is not a viable option for our land given the management requirements needed to prevent erosion, wilding pest species, pest incursion, and/or fire. This is especially the case for Permanent exotic forestry, which is still a relatively recent new land-use and its implications will only be properly understood with time and greater experience.

The result of whole scale forest planting on the resilience of rural communities is also substantial. Large areas of planting reduces the quantity of people living and working permanently within an area and reduces the flow of goods and services on a continuous basis.[12] This can be especially pronounced for regional economies that have a strong reliance on the red meat sector. B+LNZ acknowledges the potential role that forests can play in helping our landscapes retain their soils in the face of increased storm and flood events. We believe that diverse landscapes are required in order to support thriving rural communities and rural landscapes.

New Zealand's current use of offsets is contributing to unnecessary negative social and economic consequences for our rural communities and national economy for the benefit of fossil fuel intensive industries and activities. A continued heavy reliance on forestry offsets will not support 'just transition' for Aotearoa's rural communities and the current settings in the NZ ETS must change.

- Quantifying the impact:

Based on analysis from the B+LNZ Economic Service, the CCC's recommended planting rates Table 3 Scenario 2 Afforestation 50,000 ha per year) there would be a 29% reduction of the grassland area by 2050. Assuming a conservative stocking rate of this land was 8.0 su per ha, the cumulative NPV loss would be $16.3 billion by 2050, or on average $562m per year over 29 years. Please see Appendix 1 for further information and additional scenarios.

Just under a third of New Zealand's total land area is used for sheep and beef (mixed agriculture), comprising about three quarters of pastoral lands. Previously, Te Uru Rākau – New Zealand Forest Service has identified 2.8 million hectares of farmland suited to afforestation.[13] Although estimates of the sheep and beef estate highlight that 8.9 million hectares are currently being managed by sheep and beef farmers, this does not differentiate between the area of this land that is currently used for production. We estimate that there is currently just over 5 million hectares of grassland used for sheep, beef, and deer production.

Based on different assumptions of carbon price and associated change in land use, we could see a total of ~463,000ha to ~798,000ha converted from sheep and beef land to forestry (including carbon) from 2017-2018 to 2030-2031. If these projections are realised, 8-15% of the total productive grassland sheep and beef land in 2021 would go into trees by 2030. This

[12] See link to the full report here: https://beeflambnz.com/sites/default/files/Wairoa%20Afforestation_FINAL.pdf

[13] Hon. Stuart Nash and Hon. James Shaw. New rules proposed for carbon farming of exotic forests in future. 3 March 2022. Accessed: August 2023. https://www.beehive.govt.nz/release/new-rules-proposed-carbon-farming-exotic-forests-future

afforestation would displace between $2.6 billion and $4.8 billion worth of export receipts over 8 years. The respective NPV of these dollar amounts at a discount rate of 5% would be $2.1 billion and $3.8 billion.[14]

We acknowledge the likely costs of meeting New Zealand's emissions reductions targets will also be substantial. However, this is not just an economic argument about how emissions are 'paid for'.

4. A better approach

- ### Integrated forests within farms:

We believe there is a better way to utilise offsetting, whilst maintaining food production, vibrant rural communities, strong export revenue, and achieve social, cultural, and environmental outcomes. Integrated and alternative plantings and native forest management integrated within farming systems can help support the resilience of farming businesses and diversify income streams. Many of our farmers are eager to establish and manage more trees on their land and want to use the NZ ETS to do so.[15]

New forest planting would have a more positive impact if it was done in an integrated way within existing farms. Additionally, there is an opportunity to recognise, incentivise, and reward the work many farmers are doing to support additional carbon removal capacity of older native forests.

B+LNZ supports the use of forestry offsets that can be integrated within farming operations and provide co-benefits for our farmers, their land, and their communities and that can support the aspirations and unique needs of Māori landowners. Facing the impacts of climate change will be challenging, as many of our farmers recently affected by Cyclones Gabriel and Hale can attest to. We must think carefully about how best our farmers can be supported to manage the impacts of a warming world along with changing market expectations and prices.

B+LNZ believes that forest planting and management should occur in ways that are not detrimental to rural communities. B+LNZ does not wish to constrain the positive opportunities that forest carbon offsetting provides for our farmers but are concerned about the short and long-term effects of unmanaged and uncontrolled land use change in parts of New Zealand. Changes are required to both the NZ ETS as well as wider resource management policy settings.

Given the clear benefits of integrated forests within farming systems, and the significant risks associated with whole-scale farm conversion, there is also a need for clearly balanced emissions removals and reductions. Without this balance clearly stated, it is hard to know what changes to the NZ ETS would best fulfil expectations.

- ### The need for a clear direction:

[14] See further detail in Appendix 1.

[15] For a summary of Sheep and Beef Farmers' responses to a range of questions posed at the beginning of the consultation period, please see Appendix 2.

The history of vast fluctuations in market supply and demand (and thus price) is not sustainable if the NZ ETS is to be the 'core tool' to achieve New Zealand's climate change aspirations. If the goal of the NZ ETS is to reduce emissions, it must be set up to do this effectively. Whether or not this is done at 'least cost' amongst the economy or amongst emitters is a different question.

Although there can be a stated preference for the NZ ETS to encourage emissions reductions as compared to removals, it is hard to know which option to choose if there is no clarity on the long-term trajectory of carbon offsets and their use by emitters or the nation. Without this direction, the price of carbon in the NZ ETS will be more strongly linked to the confidence in the market as compared to the real costs of emissions reductions.

Deciding on the direction of emissions reductions vs. removals on the path to net zero will be challenging but the conversation must be had. We request further engagement and analysis with officials on the objectives to be achieved and how the NZ ETS, as one of many tools, could be best utilised to achieve these.

Farmers support a 'fundamental' change to the NZ ETS but also want to utilise carbon forestry opportunities to achieve multiple business and environmental objectives.[16] It is challenging to land on a single option presented in the discussion document given the limited information on impacts on emissions prices and how the options presented can be further expanded, refined, or combined. Additionally, it is challenging to understand how the preferred option will best balance multiple objectives, including support for climate resilience, provision of co-benefits, rural land use flexibility, certainty for the NZ ETS market, and achievement of emissions reduction targets.

The Government should do more to articulate the problem or problems clearly, which it is trying to solve. Just as a diverse range of policy interventions has created a range of problems articulated in the discussion paper, it is likely that more than one policy solution is needed to address some or all of the problems. For example, the fire risks associated with inappropriate permanent exotic afforestation will need a different policy solution to perceived low levels of indigenous afforestation.

A wider set of objectives than the achievement of climate change targets or commitments is needed. These changes must be guided by a set of core principles ideally included with a national sequestration strategy or carbon removals strategy.[17] The development of this strategy should be done in partnership with a variety of stakeholders, especially red meat producers and land stewards, and informed by a set of guiding principles[18]. There also needs to be a standalone analysis of how the government intends to make decisions around the gross-net balance, and this should underpin the decision-making around NZ ETS reform options.

[16] See Appendix 2 with further detail on Farmer views.

[17] RT Hon Jacinda Ardern, Hon Damien O'Connor, and Hon James Shaw. *Government sets out next steps for on-farm sequestration strategy.* 30 November 2022. Accessed: August 2023. https://www.beehive.govt.nz/release/government-sets-out-next-steps-farm-sequestration-strategy#:~:text=%E2%80%9CThe%20Government%20has%20already%20committed,%2Deffective%2C%20and%20scientifically%20robust.

[18] See Appendix 3 for a draft set of principles to inform policy setting changes.

- The changes we think are needed:

Urgent changes are needed to numerous policy schemes providing both short-term and long-term policy solutions.[19] The core focus of these changes will be to ensure trees (permanent or rotation, exotic or native) can best 'fit' within our rural landscapes to provide resilience to our rural communities and nation. We see urgent changes to the NZ ETS as the most effective approach but in the short-term the government should explore a range of possible tools such as further limits on foreign investment; limits on some exotics being put into the permanent category of the NZ ETS (to address "carbon only" farming); and support for regional and/or district councils to better manage the impacts of land use change at the community level.

We would encourage particular engagement and refinement of Options 3 and 4 and do not support further work on Options 1 and 2. Under either Option 3 or Option 4, ETS-driven afforestation signals could remain the same or even grow stronger relative to emissions reduction incentives. The policy change would ensure that such an outcome is the result of intentional government policy, and not an unintended result of crude policy settings (as is currently the case).

The implementation of Option 3 or 4 would give the government additional tools for climate action, but not determine how much these tools are to be used (if at all). We strongly support the implementation of limits within the scheme to the use of forestry offsets. This would better align the NZ ETS settings with how other schemes internationally manage the use of forestry offsets (if they allow them at all).

We do not have any strong views however on what level these limits should be placed at. We would appreciate further engagement with officials on these details. In addition to the structural changes to how forestry is treated in the NZ ETS, novel vegetation categories should be entered into the NZ ETS; especially those in line with the He Waka Eke Noa Partnership recommendations. Work completed as part of the Max Carbon Programme[20] will be key to providing the evidence base required to include recognition for additional vegetation types, especially pre-1990 forests.

We are more uncertain about the inclusion of alternative carbon removal categories given the limited understanding of their scientific rigour and ability to be permanent and additional. We are also unclear what their 'onboarding' pathways and requirements would be. However, we encourage co-development so that potential suppliers of alternative carbon removals have certainty on the conditions under which their actions can be rewarded in the NZ ETS.

We agree that incentives should be strengthened for emissions removal activities with broader environmental outcomes and co-benefits beyond sequestration (e.g. indigenous forest biodiversity). The tool to deliver this however does not have to be the NZ ETS.

We also agree with better management of extensive planting of permanent forests (especially exotics) which carry significant risks when meeting our climate, adaptation, and biodiversity objectives. Monoculture exotic forest species will become increasingly exposed to risk, from

[19] For an external analysis and justification for change, please see an independent report by Meredith Connell attached as Appendix 4.
[20] For further information see here: https://www.mpi.govt.nz/dmsdocument/54544/direct

pests, disease, and extreme weather amongst other threats. Planning for the future now is required to manage the inevitable risks for future generations.

This includes placing limitations on the inclusion of exotics in the Permanent Forest Category, changing the accumulation of carbon overtime for ‘transition forests’, increased requirements for forest management systems that are less proven as well as minimum requirements for all participants (native or exotic species initially established).

We believe that the proposed exclusions will suit many of our farmers but still have concerns about what requirements there will be for the land after the contract for the PFSI has ended and how the PFSI conditions relate to potential changes to the conditions for forests/carbon forests under the NES-PF or forthcoming guidance under the novel Spatial Planning Act. We are also concerned by the potential disincentive to establish native forests if minimum management requirements are put in place. Thus, we strongly support further analysis and options analysis on tools or mechanisms that can better support the establishment and management of native forests integrated within farming systems.

5. Detailed responses to "Review of the New Zealand Emissions Trading Scheme" consultation questions:

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

Yes, based on what we have seen recently, high carbon prices are likely to drive exotic forest plantings rather than emissions reductions and indigenous afforestation. We are unsure if the supply of units in the scheme will be too great to meet demand in the mid-2030s, however.

2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

No, we do not have any evidence to share about gross emitter behaviour (sector specific, if possible) in response to NZU prices.

2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

Yes, based on our assessment of land purchases and intentions since 2017, there is a strong relationship between increasing carbon price and the scale and pace of land use change from sheep and beef farming to exotic forestry. B+LNZ does not track the change in tree planting rates/areas integrated into existing sheep and beef farms but intends to do this in future.

See our most recent report, covering the rate and scale of land use change in response to increasing carbon prices here:
https://beeflambnz.com/sites/default/files/2023-08/Afforestation-Review-2023.pdf

Additionally, please see MPI's most recent Afforestation and Deforestation Intention's survey findings indicating that close to 88,000ha of plantings are intended to be planted in winter 2023:
https://www.mpi.govt.nz/dmsdocument/57130-Afforestation-and-Deforestation-Intentions-Survey-2022

Note that for our analysis in Appendix 1 we have assumed 60,000ha has been planted in winter 2023 based on indications in the forestry sector that this review has negatively impacted investor confidence, and thus planting intentions for this winter.

2.4 Do you agree with the summary of the impacts of exotic afforestation?

Yes, in-part. The summary concisely outlines the challenges posed, however the risks posed to New Zealand's reputation from relying on monocultural forestry offsets to meet climate targets is not mentioned, and the negative impacts on social, economic, and climate resilience outcomes in rural communities caused by blanket afforestation are minimised and not highlighted enough. The loss in export revenue as a result of land use change, the

limited permanent presence of people in rural communities, and increased risks to the impacts of climate change requires further focus.

See Appendix 1 for further detail on the export revenue impacts of land use change from sheep and beef. Additionally, the jobs provided by forestry and carbon forestry are not as permanent or consistent as those provided by sheep and beef farming. A study focusing on the Wairoa District in Hawke's Bay found a decline in local expenditure as a result of conversion from sheep and beef farming to forestry and that this expenditure was not spread as evenly over time due to increased expenditure at forest harvest. Additionally, forest industry jobs are less diverse and consistent and sheep and beef farming generates a greater mix of job types both in terms of labour and services in comparison.[21]

We also note that we are very unclear of what the Government's 'right tree, right place, right purpose' strategy actually is and how this would manage the identified challenges. We request further engagement with officials on this strategy and its plan for implementation.

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

Yes, the primary purpose of the NZ ETS should be to encourage least cost abatement among emitters. However, this must also consider additional 'costs' in addition to monetary costs of emissions reductions. Note that we agree that no one policy instrument, including emissions pricing, can achieve the necessary emissions reductions and removals that are needed.

The government should be clear and transparent about where emissions reductions are expected to come from within our economy and at what costs (environmental, economic, social and cultural) and clear about what part the ETS is intended to play.

We agree that the NZ ETS should be used to create a preferred price pathway for emitters to provide them with strong signals to reduce their emissions and that a different price pathway or mechanisms may be required to encourage the desired amount of afforestation to meet our international commitments and domestic targets.

We do not have additional information on the costs of emissions reductions for sectors currently in the NZ ETS.

The NZ ETS is not the right tool to encourage emissions reductions within the agricultural sectors. As included within legislation currently, pricing emissions at the processor level will not encourage effective emissions reductions to occur across the supply chain. Rather, the setting will operate as a tax on meat production, rather than an incentive for farmers to better manage and reduce their emissions within the farm system. We are committed to a collaborative process to ensure effective farm-level reporting and emissions pricing if and when it is appropriate. To be clear, we will not accept any system that puts the viability of sheep and beef farmers at risk. However, we are eager to work together to resolve the outstanding issues of recognition for sequestration, equity, pricing, and timing of implementation.

[21] Case Study: Socio-economic impacts of large-scale afforestation on rural communities in the Wairoa District. Link to the full report:https://beeflambnz.com/sites/default/files/Wairoa%20Afforestation_FINAL.pdf

We are eager to work with the Government and officials to address our concerns further. We also believe that ongoing investment in research and development, education, extension, and technology uptake is needed and support this fully.

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

We do not have strong expertise in this area but note that if emissions are 'leaked' to less emissions-efficient international competitors this does not support domestic or international aspirations for a just transition. We particularly agree with the discussion document when it notes that emissions leakage is a risk for not only industries included in the NZ ETS but also a risk for the agriculture sector. This is because the NZU price leads to the blanket afforestation of emissions-efficient sheep and beef farms that supply sought after food to global markets.

Additionally, we agree that a higher emissions price could disproportionately and aggressively impact lower socio-economic households and those segments of society with fewer low emissions alternatives available.

3.3 How important do you think it is that we maintain incentives for removals? Why?

We think it is very important to retain incentives for integrated plantings and carbon removals. Many of our farmers are eager to establish a variety of plantings within their farm systems.[22]

It is important for government to work with external stakeholders to strongly consider how forestry offsets should be used. This is in-line with the most recent guidance by the Science Based Targets Initiative which strongly recommends that offsets should be used as a 'last resort' rather than a first port of call. Additionally, that the use of forestry offsets should be extremely limited for fossil fuel emitters and rather only provided for those in the land-based sectors.[23] For example, we believe that the ability for fossil fuel emitters to utilise forest removals should be reduced overtime while emitters of biogenic nitrous oxide or methane should be provided with a greater ability to use these units to meet their potential emissions reduction requirements.

4.1.- 4.4 Do you agree with the description of the different interests Māori have in the NZ ETS review? What other interests do you think are important? What has been missed? How should these interests be balanced against one another or prioritised, or both? What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

We are unable to speak on behalf of Iwi or Hapu and thus are unable to say whether the description, breadth, and balance of the interests expressed in the discussion document

[22] For a summary of a recent survey we completed of our farmers and their views on some of the consultation matters, please see Appendix 2.

[23] Science Based Targets. *Carbon removals in Forest, Land and Agriculture (FLAG) Pathways.* 12 September 2022. Accessed August 2023: https://sciencebasedtargets.org/blog/carbon-removals-in-forest-land-and-agriculture-flag-pathways

is appropriate. We do see some opportunities that exist as part of the NZ ETS review and have limited views on how these could potentially be realised.

We agree that there will be significant effects of the review and outcomes on Māori Agribusiness interests in forestry and carbon farming. As noted in the discussion document the interests of Māori in this issue are complex, diverse and heterogeneous. This is especially the case given the legal status and characteristics of Māori owned land. It will be important that any potential changes to the NZ ETS, are done in partnership with Iwi/Māori. Changes need to recognise the unique characteristics, issues, aims, challenges and opportunities of Māori landowners.

B+LNZ supports the Crown upholding the principles of te Tiriti o Waitangi. We recognise that the Government has a legal responsibility to honour the principles of the te Tiriti o Waitangi and this responsibility equally applies to New Zealand's climate change and forestry policies. The NZ ETS review provides an opportunity for the Crown to better clarify how breaches of te Tiriti can be rectified as part of our sustainable land use decisions and framework and the obligations there are on the Crown as Tiriti partners. This can support a just transition for Māori when managing our impacts on global climate change and adapting to changing climate conditions.

B+LNZ also acknowledges that there remains a large amount of work to address historical injustices incurred by Māori and to improve socio-economic outcomes. Such issues should be addressed directly and appropriately, and a broken forestry settings policy within the NZ ETS should not be used to attempt to compensate for inaction in other areas because of the potential for some Māori landowners to make large amounts of money under current NZ ETS settings.

There are specific opportunities as part of this review to provide confidence and clarity on the use of forestry offsets, which can be a key source of income on Māori land. The review can also ensure better recognition and reward for a broader range of vegetation types within the NZ ETS as well as provide accommodations within the permanent forest category for Māori land to establish forests that suit their aspirations and recognise their constraints e.g. ownership structures.

Despite Māori and farmers' important role in addressing climate change, they are not currently receiving recognition for all their sequestration efforts. Māori landowners and farmers must be able to access opportunities from exotic and native trees on their farms and receive full financial recognition for the real sequestration occurring.

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

Yes, but this must be done as part of a wider conversation on the role of the NZ ETS, or other policy mechanisms, to achieve the desired balance between emissions reductions and removals.

The preferred mix will need to be informed not just by New Zealand's domestic short and long-lived gas targets but also by our international commitments under the Paris agreement, or future agreements. It will also need to be informed by the tangible and ongoing financial, cultural, social, and environmental impacts being felt by rural

communities as a result of current NZ ETS policy settings in addition to impacts on current investments.

Decisions on what the 'correct' balance between net and gross emissions will be challenging to make but the longer this conversation is delayed, the more challenging it will be to change the status quo.

Additional and alternative policy mechanisms or measures to the NZ ETS are likely needed to deliver a preferred ratio of emissions reductions vs. removals. This is not something to avoid, but to accept and address.

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

Yes. The NZ ETS needs to drive gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities. This issue is complex and will impact all segments of New Zealand both now and into the future.

A policy lens that exclusively focuses on achieving gross emissions reductions 'as quickly as real-world supply constraints allow', is likely to lead to overly simplistic solutions that cause perverse policy outcomes. Other critical factors need to be considered, such as:

- Avoiding emissions leakage,
- The well-being of rural communities,
- New Zealand's commitment towards achieving all 17 Sustainable Development Goals, and
- Consistency with a climate resilient future New Zealand.

It is important to note that other Emissions Trading Schemes operate solely with the aim of incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities. New Zealand's settings are out of line with the international community in incentivizing forest offset planting over emissions reductions.

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard- to-abate emissions in the longer term? Why/why not?

Yes. However, the NZ ETS may not be the best tool for the job depending on the context of the policy problem, and the type of incentive required to achieve the desired behaviour change. It is also important to differentiate between our domestic and international commitments.

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

Yes. Of these criteria we consider the support for co-benefits, mitigation of distributional impacts, and functionality of the NZ ETS market to be the most important. However, we consider that as part of the functionality of the system, clear direction and confidence needs to be given to NZ ETS participants. The extreme fluctuations in price and confidence in the market are not sustainable (albeit not new given the history of the scheme and its implementation).

5.5. Are there any additional criteria or considerations that should be taken into account?

Yes. We believe that there should be additional criteria that allows evaluation of New Zealand's settings relative to our trading partners and counterparts. Many other nations and firms are moving away from a policy of simply meeting climate targets, towards a framework that promotes a just transition towards achieving not only climate targets but also other targets, such as those that improve biodiversity, food security and equity outcomes. Large companies such as Nestle and large jurisdictions such as the European Union have both recently banned the use of offsets to reach climate goals. New Zealand policymakers should not ignore this trend.

We also believe there should be further expansion of the criteria to 'mitigate distributional impacts' to ensure effective management of a current asset (carbon forestry units within a permanent forest for example) that changes to a liability (requirement to maintain the land in forest with no carbon unit income to support this). Currently, an investor who has a mature carbon forest that has become a liability can theoretically sell those assets to a company that is willing to structure their operations in such a way that they can declare bankruptcy and walk away from the asset. Without strong consideration of this risk, local communities will be left having to maintain aging carbon forests (potentially paying to transition these forests into native plantings).

6.1. and 6.3 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5? Of the four options proposed, which one do you prefer?

B+LNZ believes Options 3 or 4 represent the best options to achieve climate goals sustainably for farmers and rural communities if adequately implemented. They both have the potential to achieve the primary objective to prioritise gross emissions reductions while maintaining support for removals.

B+LNZ has been asking for 'limits to forestry offsets in the NZ ETS' for some time. Both Options 3 and 4 could deliver this but the provision of confidence to NZ ETS participants will be key. Option 3 would enable the government to place a limit on the proportion of an NZ ETS surrender obligation that can be met with forestry offsets (as is the case for all other jurisdictions with a meaningful carbon price). A separate limit could be enabled for sequestration activities that generate NZUs from exotic forest activities as compared to native forest activities. We do not think it is wise to adjust the relative 'value' of forestry offsets as compared to NZUs by discounting the NZUs received. This is neither grounded in the reality of forest carbon removals from different sources or science-based.

We do not support Options 1 and 2. We firmly believe that Options 1 and 2 would make the status quo situation even worse and leave New Zealand further out of step with international schemes. Further increasing the demand for forestry offsets will likely significantly harm food production, increase global emissions via emissions leakage and likely undermine political support for the NZ ETS overall.

No matter the option chosen (or how they are combined), we request the Government consult further with external stakeholder groups, such as B+LNZ, to ensure that the unique characteristics of farmers and rural New Zealanders are adequately considered. We also request government to work as quickly as possible while also taking the time (and resources) necessary to complete analysis and options implementation that is long-lasting.

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in Chapter 5? Why/why not? Please provide any evidence you have.

Yes, as much as we are able given our scope of expertise. It is not clear how many other options were considered or how many distinct sub-options there are within each high-level option.

Please see attached report from Meredith Connell in Appendix 4 outlining similar options (but with different assessment criteria). We request officials to consider potential changes to the Permanent Forestry Sink Initiative (PFSI) settings to be made in light of potential changes to the wider NZ ETS forestry settings.

6.4. Are there any additional options that you believe the review should consider? Why?

We request further analysis on the permutations of Options 3 and 4 to better inform submitters responses as well as additional analysis on the impact of speculation on the market and its influence (or lack thereof) on the achievement of the core purpose of the NZ ETS.

We also request further analysis on how the establishment of integrated native plantings can best be supported. One option is to 'front load' the amount of units received for native forest plantings so they are more comparable with the carbon units received for exotic forest. However, this could come with significant risks for both the Crown and participants in their ability to meet their future obligations.

Lastly, we encourage officials to assess the impact of speculative investment, or lack thereof, on emissions reductions and removals. It is not clear from our perspective what benefit, other than to investor returns, that having a speculative market for carbon units has.

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

It is hard to know what impacts are likely to occur given the limited detail on the options and their implementation. However, we encourage further assessment on how a consistent split-gas (short vs. long lived as well as biological vs. fossil) approach can be taken. This could better articulate what is being 'asked' of different types of GHG emissions and how their respective reductions would reduce New Zealand's contribution to global warming

6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

Unsure, we are unable to speak on how the options will affect Māori. However, we have outlined some considerations unique to Māori farmers and we note that many of the impacts that apply to sheep and beef farmers equally apply to Māori farmers as a segment of the sheep and beef sector.

7.1. Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation?

Depending on the settings and their implementation, it could be more beneficial to include recognition and reward of the co-benefits of planting via a separate mechanism than the NZ ETS. Arguably, providing additional carbon units as recognition for other benefits would risk the integrity of NZUs as only representing 1 tonne of carbon per unit. However, any ETS scheme can tailor settings to what is desired and consider how the rewards provided to one kind of 'ecosystem service', such as carbon removals, is done in partnership with other nature-based solution recognition and reward.

Acknowledging any recognition of other benefits provided by vegetation is significant change from status quo. How this is done in practice still needs to be further investigated. At the core however, are questions about whether or not the ETS is the best way for this happen. Although it is an existing tool, without knowing the aim of any additional market or scheme, it is hard to say that the ETS would be suitable.

7.2. If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

We believe that options 3 or 4 are best able to support wider co-benefits if this is chosen to be done via the NZ ETS. This is because these options could encourage increased utilisation/value of native forest carbon removals as compared to exotic forest removals. It is unclear however whether and how the NZ ETS settings could best encourage integrated, as opposed to whole-scale, forest plantings.

7.3. Should a wider range of removals be included in the NZ ETS?

Yes, our farmers should receive recognition and reward for protecting existing native flora and fauna, and the additional carbon storage benefits that this work provides. We strongly believe that additional categories of on-farm vegetation should be recognized and rewarded in the NZ ETS. This includes carbon captured by pre-90 forests, riparian plantings, shelter belts, scattered trees, and smaller (.25-1ha) areas of plantings. The Max Carbon Programme will go some way in highlighting how these removals are removing additional carbon from the atmosphere and could be rewarded.

Whether and how non-vegetation forms of carbon removals are recognised is a separate matter. For example, many of our farmers support the recognition and reward of soil carbon. Based on our understanding of the most recent science, it can be challenging to ensure that carbon removed by New Zealand soils is stable in the short-medium term however.

7.4. What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

We strongly believe that the wide variety of benefits provided by on-farm vegetation (especially from native species) should be recognised and rewarded.

There are many examples to choose from when rewarding or incentivising benefits associated with vegetation; a 'market' is not the only effective approach. Other options could include lump-sum payments for actions such pest and weed control or payments in set rates for scalable actions, such as land area established in native vegetation.

Rewards can also be provided through an allocation mechanism such as a reverse auctioning or done indirectly, through a system of differential use taxes such that tax rates are lower for landholders who engage in desired land management activities or uses. Lastly, biodiversity assessment activities could be recognised and supported to confirm the success of different conservation approaches within the landscape.

To recognise other sources of removals, the ETS could be a suitable scheme but only if the incentive/reward provided by the scheme is aligned with climate change, or wider, objectives for Government. Additionally, care should be taken when assessing the 'cost' of administrative burden for the participant to ensure it is less than the 'benefit' received as part of participation.

6. Detailed feedback on proposed changes to the Permanent Forest Sink Category

• Introduction

The settings within the Permanent Forest Category of the NZ ETS encourage decisions that have long-term and profound consequences for our land and rural communities. They are also intricately connected with the wider proposed changes to the forestry settings in the NZ ETS but have the potential for faster implementation. We believe it is very important to enact the proposed changes to this category as quickly as possible for existing and new participants.

We note our disappointment in the Government's previous decision to not exclude exotics from the category from 1 January 2023. We are still concerned that the proposed changes to this category will be insufficient to manage the profound risks to rural communities, and their natural environments.

We are also concerned by the potential misalignment between the conditions proposed in this category and conditions that can, and should, be enacted under provisions in the Resource Management Act or forthcoming Spatial Planning Act. It is important for the government to be clear on the objectives, intent, and desired outcomes and to adjust a range of policy settings to deliver these. Although potentially beneficial for Government, it is bad policy making to operate without clear long-term expected outcomes for policies that have profound impacts on land uses and users, and that has limited support or engagement with rural communities.

It is still unclear if the ETS, or wider resource management framework, will be able to deliver on stated objectives for permanent forests within this consultation. We broadly support the potential changes to the National Environmental Standard for Plantation Forests (NES-PF), as well as potential guidance for Regional Councils on how best to manage the impacts of land use change in their communities. Note that we are very concerned however by the lack of detail that has been released about these changes.

We do appreciate the Ministerial inquiry into land use as prompted by the devastation in Gisborne and Wairoa by forestry slash and debris in early 2023. The prompt implementation of the forestry related recommendations from this Inquiry, and proposed changes to the Permanent Forest Category, will go some way to managing the significant concerns we have about the rapid expansion of unmanaged carbon forestry our farmers have experienced.

We do not agree however with the panel's recommendation to require permanent forest on 'highly erodible land' areas. Although these forests can help reduce erosion on highly erodible land, this requirement is not appropriate without significant public engagement and further scientific investigation. We note the recent results from a study commissioned by the Ministry for the Environment, a Rapid Assessment of Land Damage – Cyclone Gabrielle[24],which found a range of effectiveness of vegetation cover at preventing landslips and slopes. Thus, a blanket rule requiring permanent forests on highly erodible lands is not suitable and we would strongly recommend this is not pursued by central or regional governments as a 'fix all' approach. This requirement would be a significant shift for many of our hill country farmers and we are concerned by the implications of this recommendation. There is a strong need to consider the costs and ongoing management requirements of these lands and how this burden will be shared.

[24] Manaaki Whenua – Landcare Research. *Rapid assessment of land damage – Cyclone Gabrielle.* July 2023. Prepared for Ministry for the Environment. Accessed August 2023: https://environment.govt.nz/assets/Rapid-assessment-of-land-damage-Cyclone-Gabrielle-Manaaki-Whenua-Landcare-Research-report.pdf

- **Size and species conditions**

We appreciate officials further refining the presented options since their previous consultation on the Permanent Forest Category in April 2022.

We support allowing exotic species to enter the NZ ETS under the permanent category (with no plan to transition to indigenous species) if the areas established are below a certain size threshold and/or have low-wilding characteristics. This could include small plantings of pine trees as well as exotic poplar and willow tree species which can be excellent tools to prevent stream bank and soil slip erosion, they have a lifespan of less than 100 years, and can be well integrated into farming systems.

Long-lived[25] species, such as redwoods, should be allowed to enter the category as well as long as they have low wilding characteristics and are managed for-harvest.

We do not support the allowance of wilding species (such as douglas fir) to be established on any land, regardless of its ownership characteristics.

- **Conditions for permanent forests on Māori lands**

We are unable to speak on behalf of Iwi or Hapu and thus have limited views on what conditions should or should not be placed on Māori lands and how these are in line, or not, with the Crown's obligations under te Tiriti o Waitangi.

Based on a recent survey we completed of our farmers however, more than half of those who responded did not support the provision of different conditions for the establishment of exotic forests on Māori land in the permanent forest category.[26]

We note that our farmers have diverse views on the potential inclusion of exotic forests in the Permanent Forest Category on Māori land. However, we recognise the need for consideration of allowing different conditions for permanent forests established on Māori land; this could include the allowance for non-long-lived species established in larger areas. Any limited conditions on species and size of planting area on Māori land should be accompanied by rigorous management conditions, requirements, and support.

- **Carbon accounting for 'transition' forests**

We are very concerned by whether established exotic tree species will be able to effectively 'transition' to indigenous forest. Given this concern and the risks of exotic forests not transiting there will be ongoing liabilities to whoever is left with the land and/or trees after 50 years. We strongly support changes to how carbon is accumulated and received by participants intending to 'transition' from exotics to natives.

We believe 'transition' forests should be required to have an alternative carbon accounting system (long-term averaging as outlined in Option 2.2). As highlighted in the discussion document:

> *"Under the current carbon accounting approach, transition forests risk incurring significant surrender liabilities within the NZ ETS as large exotic trees are replaced by smaller, slower growing indigenous species...When the predominant forest type has switched from exotic to indigenous – the forest will switch from earning units on the higher exotic forest yield table to a much lower*

[25] 'Long-lived' can be defined as the ability to grow and thrive within a given location for at least 100yrs (if not longer).

[26] See Appendix 2 for further information on farmer feedback we have received.

indigenous forest yield table. This will create a large surrender obligation, and could impact the long-term financial sustainability of the forest model due to units needing to be surrendered as carbon stocks reduce."

In addition to participants having to return units when their forest transitions, this accounting approach also risks providing carbon units to forest areas that are unlikely to hold that carbon in the long-term. Under the current rules, there is a strong incentive for participants to establish exotics in the permanent category, receive carbon units for the 50 years that the forest is registered in the permanent forest category, and then to leave the land to its own devices, with very limited, if any, management after their conditions in the Permanent Forest Category have ended. Changing the way that carbon is credited by these forests will go some way in reducing this risk and help prevent windfall gains and future liabilities for participants or the Crown.

We support further investigation into better incentives for native forest establishment by potentially 'frontloading' carbon credits for these forests as well as updates to native forest carbon look-up tables. We also support including recognition and reward for carbon protected and accumulating in pre-1990 forests.

- **Conditions for participants in the Permanent Forest Category**

We believe that all forests in the scheme should be required to be continuously monitored under a Forest Carbon Management plan that suits its current and intended management[27]. These plans should be appropriate for the forestry type, location, and purpose.

Condition and content examples should include (at a minimum) the risk of, and plans to mitigate:

- fire,
- water access in case of fire,
- biodiversity loss or impact,
- soil erosion,
- wilding conifer spread,
- biosecurity,
- weed and pest species,
- and infrastructure impacts such as maintenance of fences, sheds and roads.

Conditions would apply to the land as well as the participant registered. Participants should not be able to abandon land in forestry once the Government has distributed all the allocated NZUs. Owners must maintain a responsibility to undertake tasks such as; wilding conifer control, fire management and pest management. If these conditions are not met, the NZUs should be repaid with a penalty. Reasonable allowances should be made for extreme force majeure events.

A focused management plan for transition forest should be distinct from a management plan for forestry without the intention of transitioning. As part of this, potential transition forests, especially at larger scales, should face stricter conditions.

As indicated by a report commissioned by MPI in 2022:

[27] Consideration should be made for continuous canopy cover forest management systems that maintains 30% canopy cover during harvest and thus is able to be entered into this category. If the forest is intended to transition and harvest will compromise the ability of the land to regenerate, ensure effective management actions are undertaken to ensure effective transitions.

> *"Transitions would be most appropriate in areas of higher rainfall with good amounts of native seed sources, healthy native forest bird populations, low numbers of browsing animals and manageable plant pest issues. Transitional forestry is only appropriate where there is committed/guaranteed long-term funding and a robust plan for ongoing forest management (including good infrastructure within the forest to support this)…Given the current state of knowledge, transitions should only be attempted at scales which are reasonably manageable."*[28]

Conditions to include would be the same as other forest types as well as an additional focus on timebound milestones to ensure establishment and management of indigenous species suitable to the site and site conditions. Conditions, transition forest or not, should apply to existing participants as well as new entrants and be outcomes focused.

Although not included in the consultation materials, we strongly encourage officials to investigate the management requirements of forests beyond the 50 year timeframe of the Permanent Forest Category. This is because many exotic forests may not be at the start of their 'transition' to native forests within a 50 year timeframe. We note that management requirements beyond 50 years may not be within the scope of the NZ ETS but could be within the scope of District, Regional, and Territorial authorities. We strongly encourage officials to further assess what requirements could or should be placed on the participants in the Permanent Forest Category after their 50 year accumulation of carbon units has ended.

- **Compliance in the Permanent Forest Category**

In terms of ensuring compliance, we are unsure who, when, and hw management plans should be audited and verified. We believe it is the Government's responsibility to ensure there are sufficient expertise and experience within the workforce to ensure these plans are able to be completed at a fair cost and to a high standard.

It is also the Government's responsibility to create new or expanded compliance tools for permanent forests entered in the NZ ETS. We are concerned that current policy settings risk forest owners accruing NZUs and potentially abandoning the forest and the associated management and rating responsibilities.

Existing participants should receive support from Te Uru Rakau to ensure their compliance and reduce the costs of this on participants who have been in the scheme prior to 2019.

[28] Forbes Ecology. *Transitioning exotic plantations to native forest: A report on the state of knowledge. Pg 6.* August 2021. Prepared for Te Uru Rākau – New Zealand Forestry Service. Accessed August 2023: https://www.mpi.govt.nz/dmsdocument/47521-Transitioning-Exotic-Plantations-to-Native-Forest-A-Report-on-the-State-of-Knowledge-2021-22

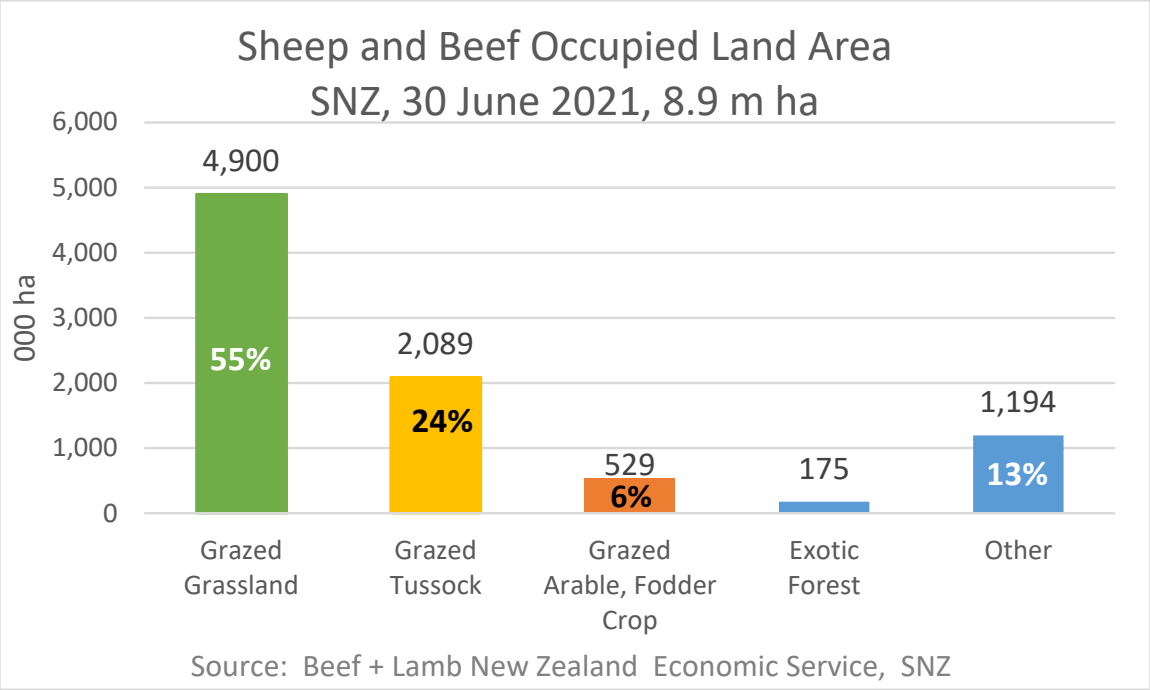
Appendices

Appendix 1: Change in export revenue as a result of Afforestation from Sheep and Beef to Forestry

Background:

Figure 1 below shows StatsNZ data on land areas assigned to sheep, beef and deer farming split into Grassland, Tussock grazed land, Arable and Forage crop land, Plantation forestry land and non-farmed land areas mainly in native forest and scrub-woody vegetation.

Figure 1 Sheep and Beef Occupied Farmland area.



Tussock grassland will not be available for afforestation as much of this will be pastoral lease land along with RMA restrictions. This leaves the grassland area for afforestation.

Comment by policy makers refer to marginal farmland for afforestation often referenced as carrying around 4.0 stock units per hectare. This ignores the critical question as "marginal" to whom?

South Island High Country Farms as businesses are "economic businesses" and are the largest farms by farmed area to be "economic" to the farm family owners.

Hard Hill Country sheep and beef farms as businesses are larger in area than Hill Country farms to be "economic" to the farm family owners.

Hill Country farms as businesses are larger in area than downland finishing and dairy farms to be "economic" to the farm family owners.

Downland farms are the smallest by area and are "economic" to the farm family owners.

All are different land uses and management systems. All farm entities are usually a mix of Land Use Capabilities (LUCs) and are connected in some manner with a flow of livestock between farming types dictated altitude, regional location climate variability, and livestock needs. There is a flow from larger hill country breeding farms of stock destined for market to downland farms who add further added value by fattening them faster. Also, there is a flow of livestock towards the hills from dairy born calves to hill country farms to rear as beef animals or replacement dairy animals.

Different classes of farms tend to have different stocking rates based on a number of factors predominantly determined by the physical limitations of the land or climate.

Four su per hectare country is largely found in B+LNZ farm management Class 2 South Island Hill Country, largely foothill range country and Banks Peninsula. This is estimated to occupy 930,000ha of grazed land. Some of this will be tussock country and pastoral lease meaning not all would be available for afforestation as a land use option. This leaves afforestation options to hill country grassland-grazing around 8.0 su per ha per farm or more. Recent years have seen whole farm sales for afforestation clearly grazing 9 su or more per ha.

Whole farm sales for afforestation have the greatest impact on land use change and is in contrast where an existing farm business carries out some afforestation most likely on poorer performing grassland areas of a farm.

This latter mosaic of farmland use is likely to have a lower impact on farm production and lower impact on its rural community (as well as downstream processors that add value to farm production for export).

Afforestation Scenarios (Set 1):

1.1 Afforestation of 16,000 hectares per year for 29 years to 2050. A total grassland area land use change to forestry of 464,000 hectares, 9.3% of the sheep and beef farm grassland area.

1.2 Afforestation of 50,000 hectares per year for 29 years to 2050. A total grassland area land use change to forestry of 1,450,000 hectares, 29% of the sheep and beef farm grassland area.

Each of these two afforestation scenarios are evaluated for impact on three stocking rates per hectare and the consequent monetary loss from Farm Gate Sales, downstream Added Value loss, and Export Receipt loss. Note that as 90% plus of Sheep and Beef production is exported it is reasonable to infer that all sheep and beef production removed by afforestation reduces export receipts. This is summarised in the following tables for:

- 4.0 stock units per ha; monetary loss in year 1 and year 29, 2050, + the cumulative loss.
- 8.0 stock units per ha; monetary loss in year 1 and year 29, 2050, + the cumulative loss.
- 12.0 stock units per ha; monetary loss in year 1 and year 29, 2050, + the cumulative loss.

In the summary tables the percentage changes are measured against the base year.

The base year is defined as the mean of three years aggregate receipts[29], at the farm gate, downstream added value and export receipts for wool, sheep meat and beef including coproducts of hides and skins, edible offal, inedible offal, tallow, meat meal, part processed wool and processed wool products.

Export receipts from dairy cattle processed ex-dairy farm, including bobby veal and co-products have been excluded.

Table1 Base Year Reference data

Sheep and Beef Sector Base Year (3-year mean)		
On-Farm Receipts	**Added Value Receipts**	**Export Receipts**
$5,218,024,907	$4,015,130,093	$9,233,155,000
57%	43%	100%

[29] 2019-20, 2020-21, 2021-22

Sheep su	Beef Cattle su	Sheep & Beef su
23,310,364	18,858,610	42,168,973
$ per Sheep su	**$ per Beef su**	**$ per Combined su**
$223.85	$212.91	$218.96

While the annual planting afforestation area may not seem that significant, there is a forestry creep over the landscape to 2050 whose cumulative total is significant to New Zealand.

Scenario 1: 16,000 ha afforested per year to 2050, totaling 464,000 ha.

Table 2 Scenario 1 Afforestation 16,000 ha per year summarises for year 1 the on-farm Sheep and Beef Farm revenue value loss that would have been used to fund on-farm activities and meet the farm owner(s) living expenses. Production at the farm gate is worth nothing to a consumer until there is processing and handling added value downstream from the farm gate. Export demand provides the market value and export receipts measured Free On-Board ship (FoB). The percentage changes shown in Table 2 measure the percentage loss relative to the base year data.

The middle block of data shows the same as above but for the year 2050 in nominal dollar terms. In 2050 the first 16,000 ha of trees will be 29 years old. And in 2050 the last 16,000 block of trees will have been planted. Overall, the average age of trees on 464,000 ha would be 15 years.

The right-hand block of data in Table 2 shows the cumulative loss in Export receipts in nominal dollars to 2050. The far right-hand column shows the Net Present Value (NPV), at a discount rate of 5%, the export receipt loss due to 464,000 ha of afforestation by 2050. At 8.0 su per ha the cumulative NPV loss would be $5.2 billion, or on average $180m per year over 29 years. Note too in the table heading that 464,000 ha equates to 9% of the 2021 grassland area.

Scenario 2: 50,000 ha afforested per year to 2050, totaling 1,450,000 ha.

Table 3 Scenario 2 Afforestation 50,000 ha per year notes that at year 2050 1,450,000 ha equates to a 29% reduction of the grassland area. At 8.0 su per ha the cumulative NPV loss would be $16.3 billion by 2050, or on average $562m per year over 29 years. However, note this significant, afforested area, that the stocking rate per ha would be well above described 8.0 su per ha in this example.

The 4.0, 8.0 and 12.0 su per ha analysis gives insight into the impacts of afforestation as it creeps onto more and more sheep and beef grassland as a land use change.

Table 2 Scenario 1 Afforestation 16,000 ha per year

Summary - Sheep and Beef Economic Activity $ loss from Afforestation to 2050								
	Afforestation rate per year 16,000 ha			Total Afforestation 464,000 ha (-9%[1])			Cumulative to 2050	
	Year 1 Activity On-farm loss $	Year 1 Activity Added-vlaue loss $	Year 1 Activity Export $ loss $	at yr 2050 Activity On-farm loss $	at yr 2050 Activity Added-vlaue loss $	at yr 2050 Activity Export $ loss $	Export $ & su[2] loss	Net Present Value 5% discount rate Export $ loss
4.0 stock units per ha								
Monetary loss	$8,146,560	$5,871,360	$14,017,920	$236,250,240	$170,269,440	$406,519,680	$6,097,795,200	$2,482,592,000
% of industry activity	0.2%	0.1%	0.2%	4.5%	4.2%	4.4%	-	
su loss	64,000			1,856,000			27,840,000	
% of stock units	0.2%			4.4%			-	
8.0 su per ha								
Monetary loss	$16,293,120	$11,742,720	$28,035,840	$472,500,480	$340,538,880	$813,039,360	$12,195,590,400	$5,212,041,000
% of base yr	0.3%	0.3%	0.3%	8.8%	8.8%	8.8%	-	
su loss	128,000			3,712,000			55,680,000	
% of base yr	0.3%			8.8%			-	
12.0 su per ha								
Monetary loss	$24,439,680	$17,614,080	$42,053,760	$708,750,720	$510,808,320	$1,219,559,040	$18,293,385,600	$7,818,062,000
% of base yr	0.5%	0.5%	0.5%	13.2%	13.2%	13.2%	-	
su loss	192,000			5,568,000			83,520,000	
% of base yr	0.5%			13.2%			-	

1 grassland area -9.3%

2 cumulative annual productive su loss to 2050

Source: Beef + Lamb New Zealand Economic Service & Insights

Table 3 Scenario 2 Afforestation 50,000 ha per year

Summary - Sheep and Beef Economic Activity $ loss from Afforestation to 2050								
	Afforestation rate per year 50,000 ha			Total Afforestation 1,450,000 ha (-29%[1])			Cumulative to 2050	
	Year 1 Activity On-farm loss $	Year 1 Activity Added-vlaue loss $	Year 1 Activity Export $ loss $	at yr 2050 Activity On-farm loss $	at yr 2050 Activity Added-vlaue loss $	at yr 2050 Activity Export $ loss $	Export $ & su[2] loss	Net Present Value 5% discount rate Export $ loss
4.0 stock units per ha								
Monetary loss	$25,458,000	$18,348,000	$43,806,000	$738,282,000	$532,092,000	$1,270,374,000	$19,055,610,000	$7,758,099,000
% of industry activity	0.5%	0.5%	0.5%	14.1%	13.3%	13.8%	-	
su loss	200,000			5,800,000			87,000,000	
% of stock units	0.5%			13.8%			-	
8.0 su per ha								
Monetary loss	$50,916,000	$36,696,000	$87,612,000	$1,476,564,000	$1,064,184,000	$2,540,748,000	$38,111,220,000	$16,287,628,000
% of base yr	0.9%	0.9%	0.9%	27.5%	27.5%	27.5%	-	
su loss	400,000			11,600,000			174,000,000	
% of base yr	0.9%			27.5%			-	
12.0 su per ha								
Monetary loss	$76,374,000	$55,044,000	$131,418,000	$2,214,846,000	$1,596,276,000	$3,811,122,000	$57,166,830,000	$24,431,442,000
% of base yr	1.4%	1.4%	1.4%	41.3%	41.3%	41.3%	-	
su loss	600,000			17,400,000			261,000,000	
% of base yr	1.4%			41.3%			-	

1 grassland area -29.2%

2 cumulative annual productive su loss to 2050

Source: Beef + Lamb New Zealand Economic Service & Insights

Afforestation Scenarios (Set 2):

2.1 Real afforestation of 238,600ha from 2017-2023 with estimated afforestation of 50k hectares per year in 2023-24 and 2024-25 and then 25k hectares per year to 2030-31.

2.2 Real afforestation of 238,600ha from 2017-2023 estimated afforestation of 50k hectares per year in 2023-24 to 2030-31.

2.3 Real afforestation of 238,600ha from 2017-2023 with estimated afforestation of 80k hectares per year in 2023-24 to 2030-31.

This analysis highlights the short-term impacts associated with land use change from sheep and beef to forest operations. Different ranges of estimated afforestation have been used to indicate the impact associated decreased (or increased) confidence in the carbon/forest sector as a result of decisions made in this review.

Based on different assumptions of carbon price and associated change in land use, we could see a total of ~463,000ha to ~798,000ha converted from sheep and beef land to forestry (including carbon) from 2017-2018 to 2030-31. If these projections are realised, 8% to 15% of the total productive grassland sheep and beef land in 2021 would go into trees by 2030. This afforestation would displace between $2.6 billion and $4.8 billion worth of export receipts over 8 years. The respective NPV of these dollar amounts at a discount rate of 5% would be $2.1 billion and $3.8 billion.

Scenario 2.1: Real afforestation rates until 2022-2023 and estimates of change from 50kha to 25kha unt030-2031

	Stock units per ha displaced by afforestation (modelled)	New afforestation annual ha actual, & modelled from 2023-24	Cumulative new afforestation ha	Sheep & Beef[1] annual Export Receipts $m	Sheep & Beef FoB Receipts annual chg actual, & modelled $m	Sheep & Beef FoB Receipts modelled Cumulative chg $m
2017-18		6,000	6,000	7,859		
2018-19		7,000	13,000	8,351	$492	
2019-20		26,300	39,300	8,817	$465	
2020-21		33,600	72,900	8,599	-$218	
2021-22		41,500	114,400	10,284	$1,685	
2022-23		64,200	178,600	9,981	-$303	
Actual Totals to 2022-23		**178,600**	-	-	**$2,122**	-
2023-24	8.0	60,000[4]	238,600		-$105	-$105
2024-25	8.0	50,000	288,600		-$88	-$193
2025-26	8.0	50,000	338,600		-$88	-$280
2026-27	8.0	25,000	363,600		-$44	-$324
2027-28	8.0	25,000	388,600		-$44	-$368
2028-29	8.0	25,000	413,600		-$44	-$412
2029-30	8.0	25,000	438,600		-$44	-$455
2030-31	8.0	25,000	**463,600**		-$44	-$499
Modelled Totals		**285,000**	-	-	**-$499[2]**	**-$2,636[3]**
NPV at 5% discount rate						**-$2,143**

1 actual FoB receipts to 2022-23, modelled change due to afforestation from 2023-24 at 3 year average of prices to 2021-22

2 modelled FoB receipt decrease in year 2030-31

3 modelled cumulative Sheep and Beef FoB receipt deficit from afforestation from 2023-24 to 2030-31

4 Manley (2023) estimated figure was 88,000 ha of afforestation in 2023. This was revised down to account for increased uncertainty in the market (based on advice from MPI officials).

Scenario 2.2: Real afforestation rates until 2022-2023 and estimates of 50kha until 2030-2031

	Stock units per ha displaced by afforestation (modelled)	New afforestation annual ha actual, & modelled from 2023-24	Cumulative new afforestation ha	Sheep & Beef[1] annual Export Receipts $m	Sheep & Beef FoB Receipts annual chg actual, & modelled $m	Sheep & Beef FoB Receipts modelled Cumulative chg $m
2017-18		6,000	6,000	7,859		
2018-19		7,000	13,000	8,351	$492	
2019-20		26,300	39,300	8,817	$465	
2020-21		33,600	72,900	8,599	-$218	
2021-22		41,500	114,400	10,284	$1,685	
2022-23		64,200	178,600	9,981	-$303	
Actual Totals to 2022-23		**178,600**	-	-	**$2,122**	-
2023-24	8.0	60,000[4]	238,600		-$105	-$105
2024-25	8.0	50,000	288,600		-$88	-$193
2025-26	8.0	50,000	338,600		-$88	-$280
2026-27	8.0	50,000	388,600		-$88	-$368
2027-28	8.0	50,000	438,600		-$88	-$455
2028-29	8.0	50,000	488,600		-$88	-$543
2029-30	8.0	50,000	538,600		-$88	-$631
2030-31	8.0	50,000	**588,600**		-$88	-$718
Modelled Totals		**410,000**	-	-	**-$718[2]**	**-$3,293[3]**
NPV at 5% discount rate						**-$2,642**

1 actual FoB receipts to 2022-23, modelled change due to afforestation from 2023-24 at 3 year average of prices to 2021-22

2 modelled FoB receipt decrease in year 2030-31

3 modelled cumulative Sheep and Beef FoB receipt deficit from afforestation from 2023-24 to 2030-31

4 Manley (2023) estimated figure was 88,000 ha of afforestation in 2023. This was revised down to account for increased uncertainty in the market (based on advice from MPI officials).

Scenario 2.3: Real afforestation rates until 2022-2023 and estimates of 80kha until 2030-2031

	Stock units per ha displaced by afforestation (modelled)	New new afforestation annual ha actual, & modelled from 2023-24	Cumulative new afforestation ha	Sheep & Beef[1] annual Export Receipts $m	Sheep & Beef FoB Receipts annual chg actual, & modelled $m	Sheep & Beef FoB Receipts modelled Cumulative chg $m
2017-18		6,000	6,000	7,859		
2018-19		7,000	13,000	8,351	$492	
2019-20		26,300	39,300	8,817	$465	
2020-21		33,600	72,900	8,599	-$218	
2021-22		41,500	114,400	10,284	$1,685	
2022-23		64,200	178,600	9,981	-$303	
Actual Totals to 2022-23		**178,600**	-	-	**$2,122**	-
2023-24	8.0	60,000[4]	238,600		-$105	-$105
2024-25	8.0	80,000	318,600		-$140	-$245
2025-26	8.0	80,000	398,600		-$140	-$385
2026-27	8.0	80,000	478,600		-$140	-$525
2027-28	8.0	80,000	558,600		-$140	-$666
2028-29	8.0	80,000	638,600		-$140	-$806
2029-30	8.0	80,000	718,600		-$140	-$946
2030-31	8.0	80,000	**798,600**		-$140	-$1,086
Modelled Totals		**620,000**	-	-	**-$1,086[2]**	**-$4,764[3]**
NPV at 5% discount rate						**-$3,799**

1 actual FoB receipts to 2022-23, modelled change due to afforestation from 2023-24 at 3 year average of prices to 2021-22

2 modelled FoB receipt decrease in year 2030-31

3 modelled cumulative Sheep and Beef FoB receipt deficit from afforestation from 2023-24 to 2030-31

4 Manley (2023) estimated figure was 88,000 ha of afforestation in 2023. This was revised down to account for increased uncertainty in the market (based on advice from MPI officials).

Appendix 2: Beef + Lamb New Zealand, Farmer Survey summary

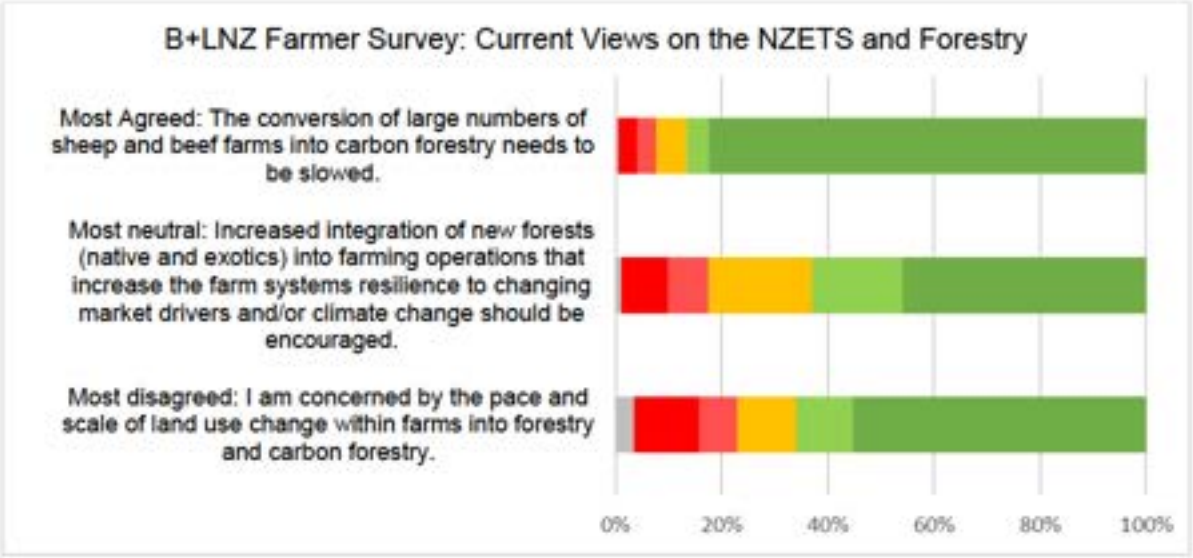
Beef + Lamb New Zealand completed an online survey between the 5th and 27th July 2023. The survey returned 171 responses from sheep and beef farmers across New Zealand which was used to generate the following graphs and inform our submission. The questions were separated across four key categories:

1. Current views on the NZETS
2. Views surrounding changes needed to the NZETS
3. Views on the Permanent Forestry Category
4. And any other potential changes

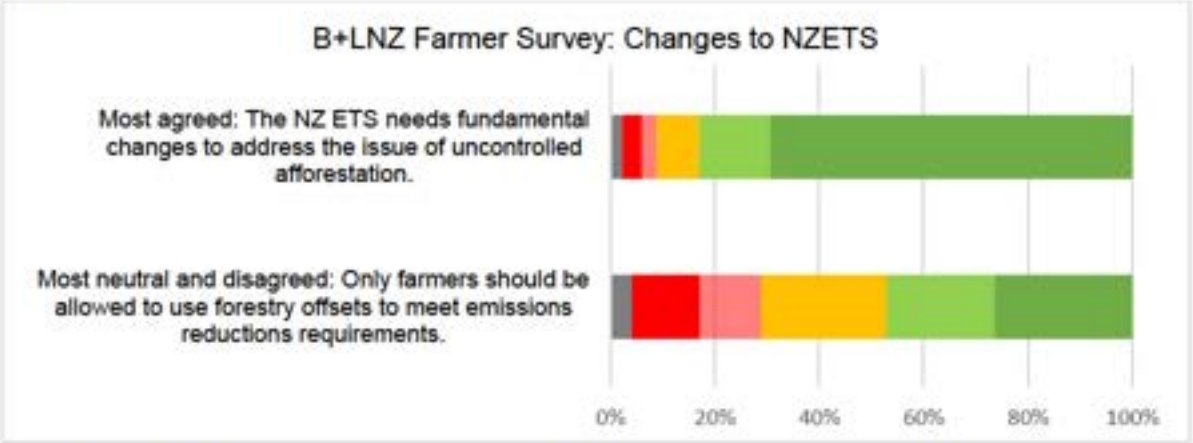
The graphs below highlight the questions that returned the most agreed, most neutral, and most disagreed statements. Table 1 highlights all survey questions that returned a 1 – 5 response.

Aside from the questions below we asked verbal questions to expand on farmer thoughts. We have not included the data from those questions below.

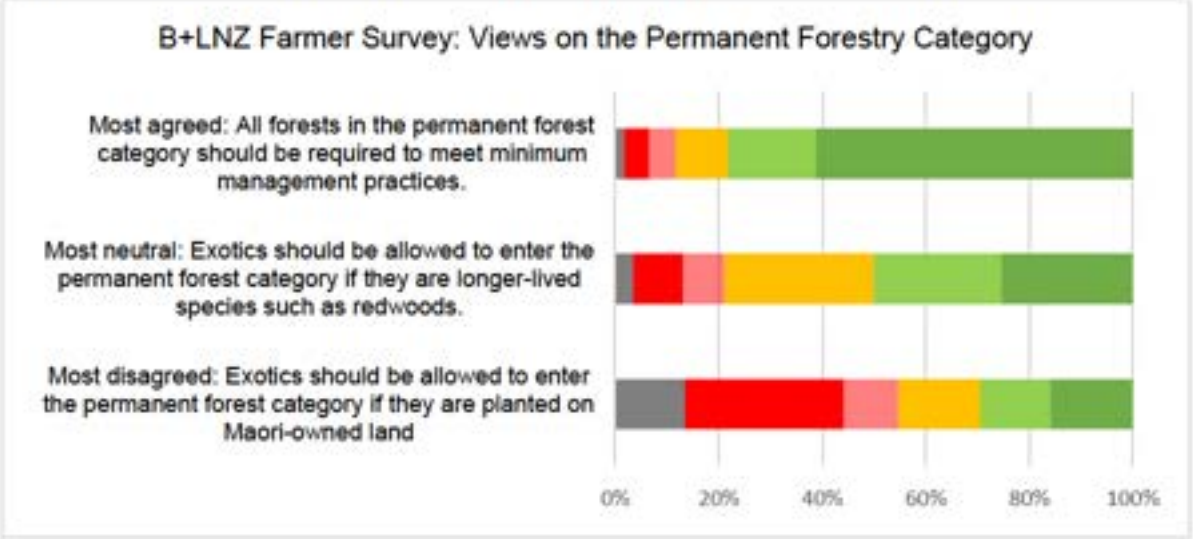
Graph 1: B+LNZ Farmer Survey: Current Views on the NZETS and Forestry



Graph 2: B+LNZ Farmer Survey: Changes to NZETS



Graph 3: B+LNZ Farmer Survey: Views on the Permanent Forestry Category



Graph 4: B+LNZ Farmer Survey: Other Potential Changes

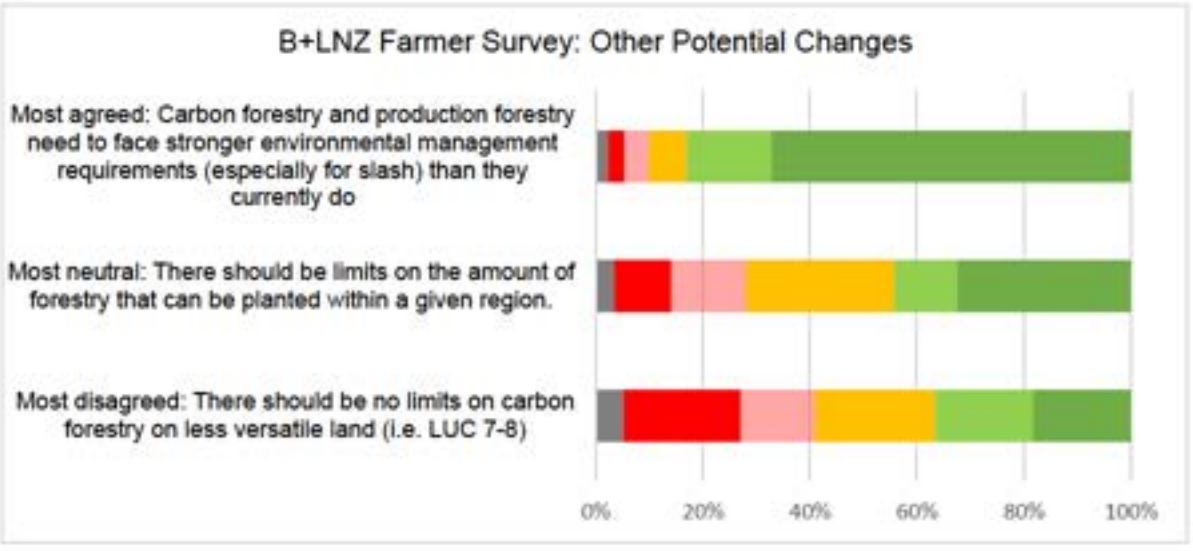


Table 1: B+LNZ NZ ETS Farmer Survey Questions. Listed in order from most strongly disagreed/disagreed to most strongly agreed/agreed.

Question	No opinion	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Exotics should be allowed to enter the permanent forest category if they are planted on Maori-owned land.	13	30	11	16	13	16
There should be no limits on carbon forestry on less versatile land (i.e. LUC 7-8).	5	22	14	22	18	18
Exotics should be allowed to enter the permanent forest category if they are smaller areas of planting (50ha).	4	19	12	25	15	25
There should be limits on how much forestry can be planted within a farm system (i.e. limit of 25% of productive area).	5	21	10	20	12	30
There should be limits on the amount of forestry that can be planted within a given region.	4	11	14	27	12	32
Exotics should be allowed to enter the permanent forest category if they meet management requirements to ensure they transition to natives over time.	4	18	6	27	20	25
Exotics should be allowed to enter the permanent forest category if they are smaller areas of planting (50ha) within farms.	3	17	11	24	16	29
Only farmers should be allowed to use forestry offsets to meet emissions reductions requirements.	4	13	12	24	20	26
Exotics should be allowed to enter the permanent forest category if they are longer-lived species such as redwoods.	4	9	8	29	25	25
The amount of total forestry should be limited across the country.	4	13	13	20	13	36
I am concerned by the pace and scale of land use change within farms into forestry and carbon forestry.	3	12	7	10	10	52
Increased integration of new forests (native and exotics) into farming operations that increase the farm systems resilience to changing market drivers and/or climate change should be encouraged.	1	9	8	19	17	46

The NZ ETS needs to align with how other countries treat forestry in their ETSs (i.e. very limited amounts).	4	7	4	18	18	49
Fossil fuel emitters should not be allowed to use forestry offsets to meet emissions reduction requirements.	3	7	6	13	17	53
There should be limits on carbon forestry on more versatile land (i.e. LUC 6 and below).	3	4	8	14	18	53
Alongside incentivizing emissions reductions and offsets the NZ ETS should be used to support other environmental objectives e.g. encouraging biodiversity and/or erosion control.	1	7	5	15	26	45
Carbon forestry should be facing the same requirements as production forestry.	6	4	4	13	17	55
The amount of forest planting incentivised by the NZ ETS needs to be limited and reduced.	2	6	5	13	17	56
The ETS should drive emissions reductions, not large-scale tree planting.	4	5	5	12	16	57
NZ should prioritise reducing emissions at home, rather than buying international credits.	4	2	5	13	13	63
I am concerned by the pace and scale of land use change of whole pastoral farms into forestry and carbon forestry.	3	5	4	5	4	71
All forests in the permanent forest category should be required to meet minimum management practices.	2	5	5	10	17	61
I believe farmers are not getting enough recognition for the carbon stored in their on-farm vegetation (especially native bush).	1	3	3	5	4	77
The conversion of large numbers of sheep and beef farms into carbon forestry needs to be slowed.	5	4	4	6	4	77
Carbon forestry and production forestry need to face stronger environmental management requirements (especially for slash) than they currently do.	2	3	5	7	16	67
The NZ ETS needs fundamental changes to address the issue of uncontrolled afforestation.	2	4	3	8	13	69

Appendix 3: Principles to inform changes to policy settings guiding climate action in the land based sectors

Warming based approach: to emissions reductions and targets which considers the way different GHG emissions and offsets impacts on global climate change in the short and long term.

Prioritise emissions reductions: Long lived gas emissions reductions need to take greater priority than forest carbon emissions removals. Different drivers should be used achieve the preferred mix as required (i.e. differential prices)

Clear direction of travel: Policy driving land use change needs clear direction on the intended outcomes (especially reductions vs. offsets) and provisions for achieving environmental co-benefits. Farmers need a level of certainty to invest.

Integrated: sustainable land use ('right activity, right place'), resilient and thriving rural communities, maintaining, and growing food and fibre exports, are prioritised and are linked with the essential freshwater and indigenous biodiversity policy initiatives.

Targeted: the objective for different policy mechanisms and tools are clearly articulated and acted upon. A variety of policy mechanisms to address the diverse range of problems is likely required, meaning that the ETS is not the sole tool or solution.

Responsible: landowners, business entities, and the government are accountable for actions, impacts, and ongoing effects

Equitable: the distributional impacts of policy settings provide equitable outcomes

Credible: sound science is used, provided transparently, and includes mātauranga Māori.

Effective: Activities rewarded lead to real impact on the ground and for our climate in line with emissions reductions targets and commitments. This means the necessary rules and standards are in place to affirm the quality of new sequestration activities, while considering international developments with respect to the fungibility and quality of offsets.

Coordinated: decisions on mitigation and adaptation are made in partnership with a particular consideration of nature-based solutions that aligns with wider sector and government objectives and activities.

Collaborative: provide fair opportunity for all stakeholders to be involved and consulted with as part of the policy development and analysis, as well as options testing.

Appendix 4: Planting out our rural communities? What is wrong with forestry offsets in the ETS and what needs to be done. Report produced by Meredith Connell.

Planting out our rural communities?

What is wrong with forestry offsets in the ETS and what needs to be done

MC.

CONTENTS

Introduction

The face of provincial New Zealand is set to change, perhaps for ever. This change is being driven not by shifts in the balance between rural and urban land use, as might be expected. Rather, it is the result of unbridled growth in exotic forestry.

In response to the current settings of New Zealand's Emissions Trading Scheme (ETS), farmland across the country is increasingly being planted in pine and other exotic species to generate carbon credits that can be traded for value in the ETS. This trend will increase rapidly from this year if policy changes are not made with urgency.

The widespread establishment of exotic forests and in particular, permanent exotic forests, is problematic because it:

i. **Displaces productive land use.** The increasing financial incentive of exotic forests is displacing the productive land uses that rural economies depend on, and that contribute so much to both the cultural fabric of New Zealand and the national economy.

ii. **Undermines long-term climate objectives.** High levels of exotic forestry planting each year delays steps to reduce gross global warming-inducing carbon emissions because these forests provide emitters with a relatively cheap way to offset their liabilities without taking action to reduce their emissions for the long-term.

iii. **Raises questions about the equity and integrity of the ETS.** Rather than confronting the emissions-reduction challenge faced by the global community, New Zealand's ETS settings allow this generation to 'plant, offset and forget', leaving the challenge to the future generations. ETS forestry settings create a weak link between who pays for emissions reductions, and who benefits from them.

iv. **Puts the ETS out of sync with offshore schemes.** In its zero-restrictions approach to the use of forestry offsets, New Zealand is an outlier, and this will limit our country's ability to participate in the global carbon-trading market.

v. **Increases environmental risks.** Permanent exotic forests present additional environmental risks, such as debris, fire, disease, pests, and the spread of wilding pines.

Forestry offsets are a key component of a scheme designed to enable our country to meet emissions-reduction targets set in legislation.[1] But they are a tool that must be managed in a way that enables sustainable and equitable social, economic, and environmental outcomes, for generations to come.

This report proposes policy options that will allow strategic management of forestry offsets within the ETS, and that provide a pathway to achieving New Zealand's wider climate goals, while ensuring land is put to best use, for the long-term benefit of all New Zealanders.

The focus of the report is on addressing permanent exotic forestry through changes to the permanent forestry category of the ETS, as the area with the most skewed incentives and therefore the greatest need for reform. Though it is stressed that, in the future, further changes to the ETS that target other categories are likely to be required.

The report has been prepared for Beef + Lamb New Zealand (B+LNZ) by MC and is designed to act as the starting point for a national discussion on the role forestry offsets play in our country's climate strategy.

About MC

With over 100 years' experience working with both the public and private sectors, MC is a large national law firm with preeminent expertise in public interest litigation, public policy, as well as local government and regulatory law. MC knows how to help both the public and private sectors reach and understand one another.

1. To be net zero for non-biogenic emissions by 2050, and 10% less by 2030 and 24-47% less by 2050 for biogenic emissions relative to 2017 emissions.

What is the problem?

The way incentives for forestry offsets in the ETS are structured and managed can only lead to excessive afforestation, particularly in the form of permanent exotic forestry. The level of afforestation likely to occur based on current settings is not a sustainable means for New Zealand to reach its emissions-reduction goals nor to provide for resilient rural communities and physical environments.

Role of forestry in the ETS

Under New Zealand's current climate strategy, the establishment of trees that can remove carbon from the atmosphere as they grow is a key tool for achieving emissions-reductions targets.[2] These trees can help offset continued carbon emissions in other parts of the economy. The strategy relies on these forestry offsets, as a low-cost emissions-reduction option, to bring down New Zealand's net emissions through to 2050.

Box 1: Gross versus Net emissions

Definitions

Gross emissions

The term "gross emissions" refers to New Zealand's total emissions from the agriculture, energy, industrial processes and product use, and waste sectors.

Net emissions

"Net emissions" means gross emissions (including all activities above), minus any emissions removal activities from forestry, or other carbon sinks.

New Zealand Units (NZUs) are a transferable asset which represents a right to emit one tonne of carbon dioxide equivalent (CO_2-e). NZUs are issued by the Government for removal activities, including the removal of carbon from the atmosphere by foresters. The scheme allows forestry owners to generate revenue by selling their NZUs to emitters throughout the economy.

Establishing and growing exotic forests, such as Pinus radiata forest, delivers removals at relatively low cost: estimated to be between $25-$50 per tonne of CO_2-e. Whereas opportunities to reduce long-lived gas emissions in other sectors cost $100 per tonne of CO_2-e or more.[3]

The market price of NZUs peaked at $88.50 per NZU[4] in November 2022; a level which provides financial returns to foresters, but not quite at the level to incentivise gross emission reductions. This means that the ETS is structured to incentivise rapid afforestation and offsetting before incentivising any gross emission reductions.

The strong orientation of the ETS towards one sector means that careful management is required to maintain balance with the rest of the economy. This is where current ETS settings have come unstuck. Recent policy changes – namely, the removal of the 'stock change accounting' and revitalisation of the Permanent Forestry Category within the ETS – have created excessive incentives for afforestation and seem certain to result in negative consequences and perverse outcomes, many of which have been brought to the Government's attention by advisors.

2. CCC (2023).
3. Estimated taken from CCC (2023).
4. See CommTrade (2023). *NZU price history, as of 14 November 2022.*

An international outlier

The absence of any qualitative or quantitative restrictions on the use of forestry offsets is a defining characteristic of the New Zealand ETS and makes our scheme an outlier in international terms. As shown by **Table 1**, other than Kazakhstan, no other ETS in the world allows such unfettered use of tradable units derived from forestry to offset carbon emissions. Even Kazakhstan, however, has control measures in place, whereby offsetting projects must be approved by the Ministry of Ecology, Geology and Natural Resources before being awarded tradable units.[5]

Table 1: National and regional emissions trading schemes and their offset limits[6]

Offset or Credit limit	ETS Name or Jurisdiction (Alphabetical)
0%	European Union ETS; Germany; Massachusetts (USA); Switzerland; United Kingdom ETS;
5% or less	Beijing (CN); California (USA); China ETS; North Carolina (USA); Republic of Korea; Regional Greenhouse Gas Initiative (USA); Shanghai (CN); Washington (USA);
10% or less	Chongqing (CN); Fujian (CN); Guangdong (CN); Hubei (CN); Oregon (USA); Mexico; Taiwan (CN); Tianjin (CN); Quebec (CAN)
33% or less	Saitama (JPN); Tokyo (JPN);
100%	Kazakhstan; New Zealand
Limits under consideration or development	Chile; Colombia (USA); Finland; Indonesia; Japan ETS; Malaysia; Montenegro; New Mexico (USA); Pakistan; Philippines; New York (USA); Nova Scotia (CAN); Pennsylvania (USA); Sakhalin (RUS); Transportation & Climate Initiative Program; Thailand; Ukraine; Vietnam.

Further, most national, and regional ETSs include a strong focus on gross emissions reduction. Typically, participants are restricted to offsetting no more than 10% of their gross emissions surrender obligations. In contrast, the primary purpose of the New Zealand ETS is to achieve net emissions reductions, allowing unlimited use of forestry units to meet surrender obligations.

New Zealand's Permanent Forestry category

New Zealand introduced the Permanent Forestry category in 2020, as a replacement for the Permanent Forest Sinks Initiative (PFSI) and came into effect from 1 January 2023. The PFSI was established in 2006, prior to the ETS' inception, and required landowners to sign a covenant agreement with the Crown which included restricted harvest and other forest management conditions on forested land established after 1989. Participants had the right to terminate at any time after 50 years (with surrender of emissions units received while in the scheme). Both natives and exotic plantings were able to be entered.

The Permanent Forestry category in the ETS allows landowners to establish any eligible forest with the expectation that the trees will not be harvested prior to age 50. Additionally, if the forest is initially established with exotic species, the expectation is that native vegetation will grow up within the exotic plantings and, over the long term, give way to a permanent indigenous forest.

This category allows a pine tree owner to enter and for landowners to benefit from the very high carbon credits for pines for 50 years until it transitions to native vegetation (this compares to the 'averaging accounting' category which only pays carbon credits for 16 years).

5. ICAP (2022).
6. ICAP (2022).

Super-charged benefits

The introduction of the Permanent Forestry Category takes the potential benefits for forest owners under the ETS and super-charges them.

For foresters, the appeal of exotic species lies in rapid growth and low establishment costs – they capture carbon (generating NZUs) more quickly than indigenous species, at less cost.

With permanent exotic forestry, NZUs are earned for as long as the forest continues to capture carbon (for upwards of 70-100 years).

In contrast, owners of production exotic forests earn NZUs only until the average carbon storage rates of their trees (at around 16 years for Pinus radiata) but do not need to pay for the carbon released at harvest (as long as the forest is replanted).[7]

Further, permanent forests are far more profitable as they require none of the infrastructure and costs required for pruning and harvesting – in particular, roads – that production forestry requires.

Other forms of forestry therefore cannot compete with the economics of permanent exotic forestry: over a 50-year timeframe, an average permanent pine forest in the New Zealand ETS will earn 7.5 times more NZUs than an equivalent area of indigenous forest.[8]

As Figure 1 illustrates, at recent NZU prices of around $70, MPI estimates an economic return of over $35,000 per hectare (ha) for permanent exotic forests, compared with $20,000 per ha for production forestry with integrated carbon forestry.

Figure 1: comparison of economic returns for permanent exotic forestry, production forestry, and sheep and beef farming over 50 years

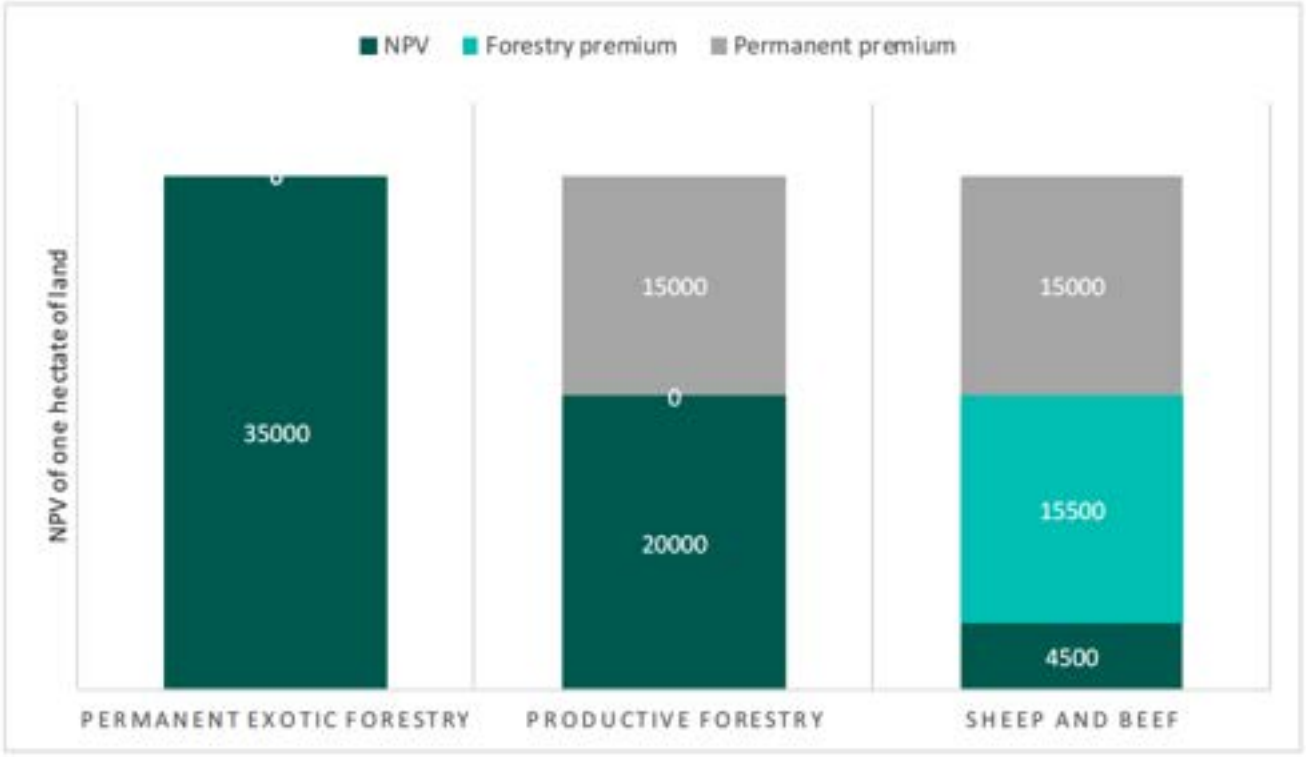


Figure 1 also shows that the gap in economic return is even more marked in the case of sheep and beef farming (forestry's main competing land use), with a 'modelled' extensive sheep and beef farm generating around $4,500 per ha.[9]

Beef + Lamb New Zealand analysis shows similar differences between the different land uses but not to the same extent as the MPI analysis (see Table 2 below).

7. MPI (2022C).
8. MPI (2022B).
9. MPI (2022B).

Table 2: B+LNZ estimates of returns per hectare over 30 years for different land uses

	Sheep Beef Farm	Production Forestry	Production Forestry + ETS (av)	Permanent Forest + ETS
NPV 30 years per ha	$8,700	$4,900	$21,300	$23,100

Note that in B+LNZ analysis, Production forestry NPV is valued at $4,900 per ha and is below the Hill Country Sheep and Beef Farm NPV of $8,700 per ha.

Surge in afforestation

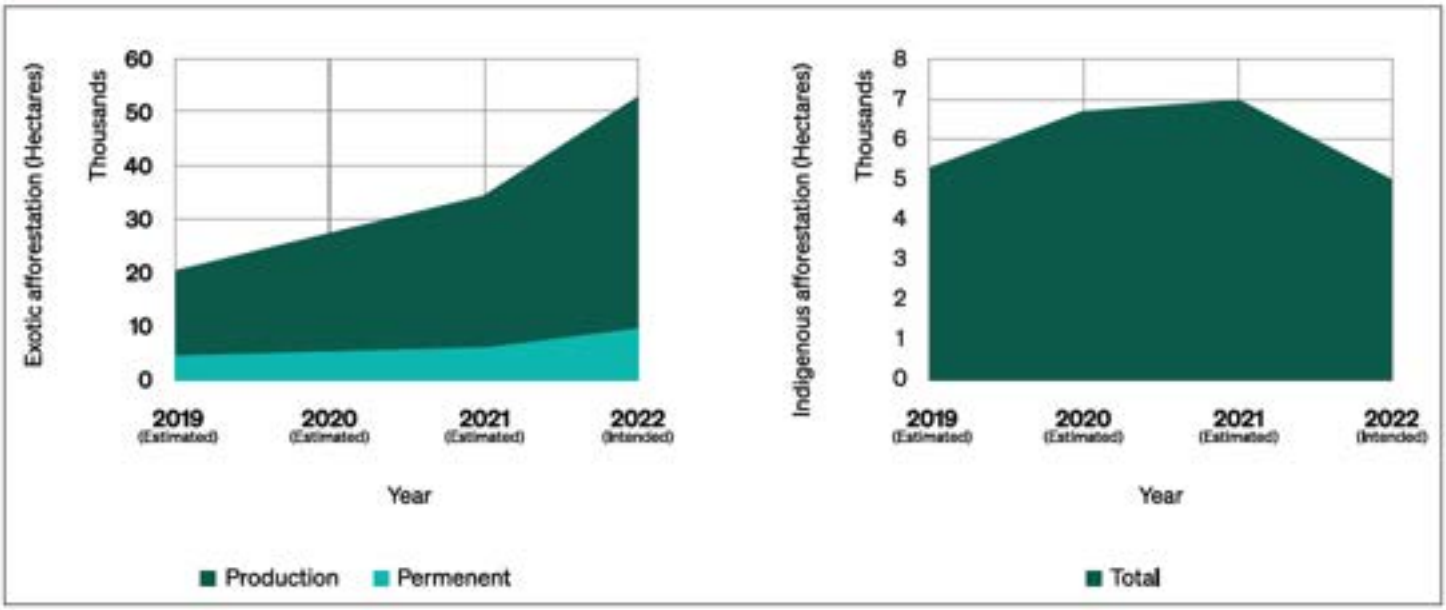
Since 2009, the New Zealand ETS had a fixed price option which acted as a de facto carbon price ceiling. This allowed emitters to pay $35 to the Government, instead of purchasing NZUs from the secondary market.

In 2019 the fixed-price option was removed to allow the carbon price to increase. The expectation was that this would start to drive a decrease in emissions, but what it has generated instead is a surge in supply to offset emissions.

Most of the initial afforestation activity has been in production exotic forests. In 2022, MPI estimates that over 50,000 ha of production exotic forests was established, up from 20,000 in 2019.

For now, the increase in establishment of permanent exotic forests has been more modest, but it is still significant. In 2021, almost 35% of farm sales occurring were intended to be used for permanent forest purposes.[10] This direction aligns with MPI's 2021 Survey of Afforestation Intentions (see Figure 2), which indicated that in 2022 10,200 ha of new permanent exotic forests were established, an increase from 5,300 ha in 2019.

Figure 2 Afforestation intentions, 2021

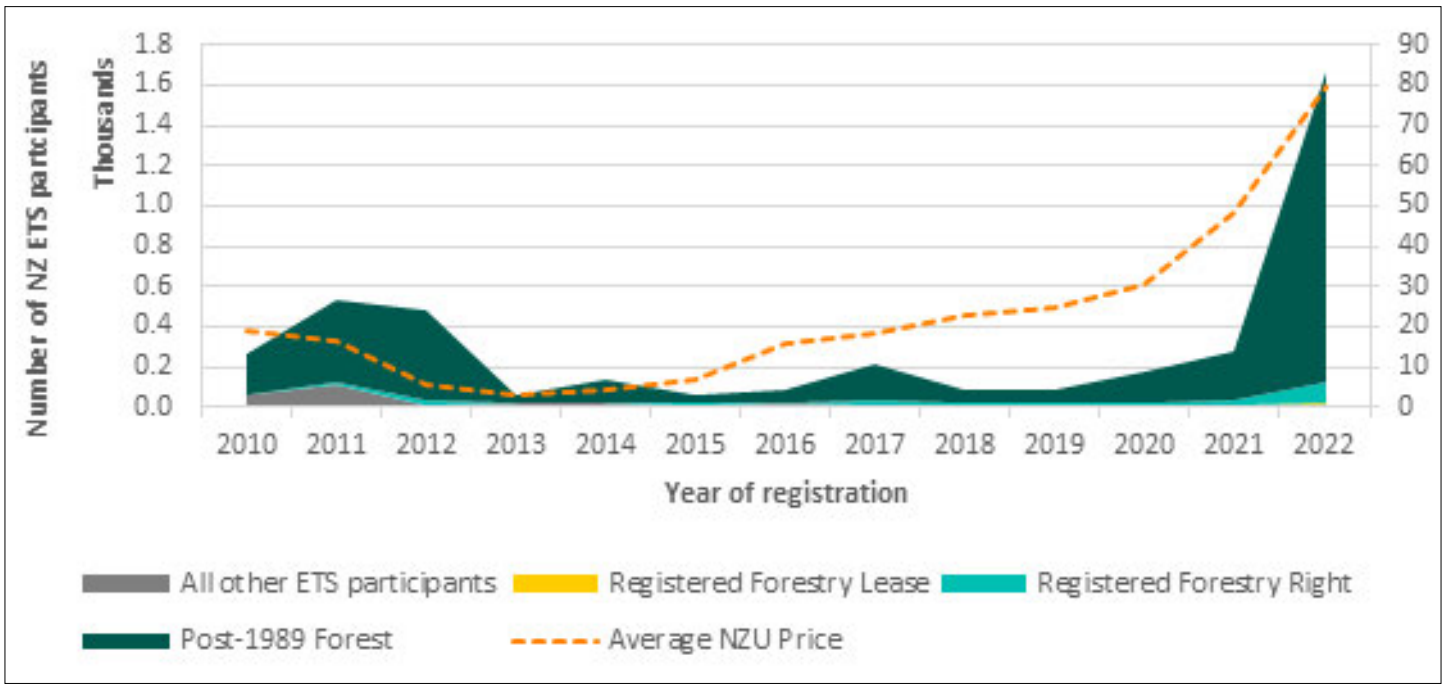


The same survey points to much lower volumes of indigenous afforestation – only around 5,000 ha in 2022, having fallen from around 6,500 ha in 2020, and 7,000 ha in 2021.[11]

Meanwhile, over the same period, the number of registrations in the ETS has increased dramatically, as landowners responded to the change in policy settings. Figure 3 shows that, from 2021-2022, there was a more than five-fold increase in registrations, doubling the total number since the inception of the ETS. This increase coincides with rapid increases in NZU prices.

10. Beef + Lamb New Zealand (2022).
11. MPI (2022A).

Figure 3: ETS registrations and average NZU prices



Critically, while the number of new plantings in production exotic forestry has exceeded those from permanent exotic forestry in recent years, the trend is expected to reverse in future.

In a 2022 Cabinet paper, MPI estimates that the ETS could drive upwards of 645,000 ha of new exotic afforestation between 2021 and 2030. Permanent exotic forestry is expected to account for over half of this new afforestation.[12]
To put this in context, growth in permanent exotic afforestation of 350,000 ha over the decade would represent an average annual afforestation rate of 35,000 ha per year; more than three times higher than the indicative rate in 2022 (which, as noted above, was already a significant jump on previous years).

This potential annual rate of afforestation is also much higher than the 25,000 ha of exotic afforestation that the Climate Change Commission estimates is needed to meet New Zealand's net zero targets.[13]

12. MPI (2022A).
13. CCC (2021).

An increase in overseas investment in forests

Increasing overseas investment in forests for carbon removal activities can be beneficial in terms of addressing climate change and conserving natural ecosystems. However, there are also several associated problems and concerns with overseas investments in New Zealand forestry. Most notably:

- **Land tenure and rights**. The acquisition of large tracts of land for forestation may conflict with local communities' land rights. Communities could become displaced or lose access to land that they have traditionally used for livelihood.
- **Monoculture plantations**: the skewed incentives for permanent exotic forestry can incentivise projects that focus on monoculture tree plantations rather than re-establishing natural forests.

Beef + Lamb New Zealand has conducted further analysis on the OIO approvals for farmland purchases for afforestation. This is summarised in **Table 3**. Note that OIO approvals for existing forest purchases were excluded from this analysis.

Table 3: Summary of OIO farmland purchases for afforestation.

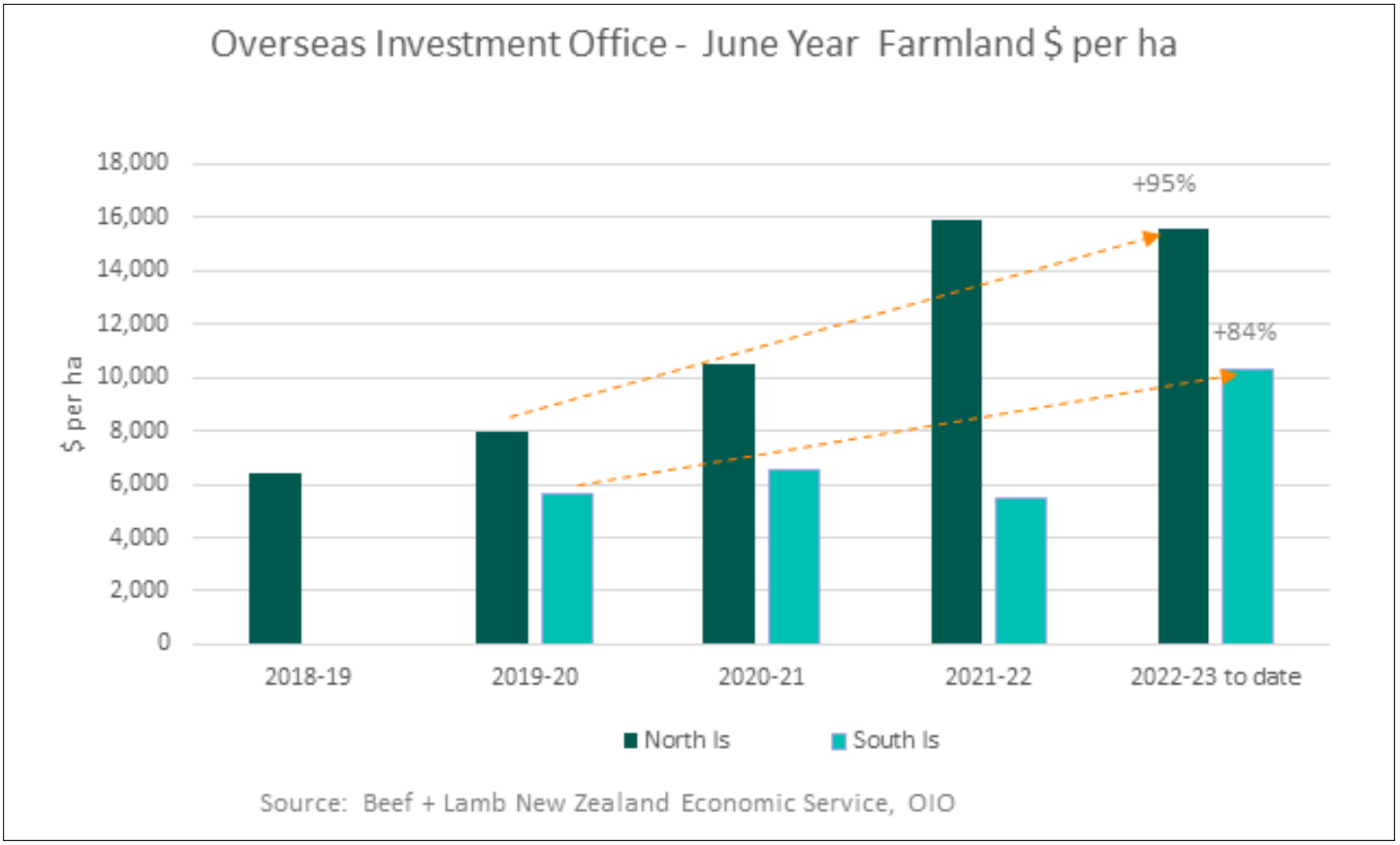
Summary of Area Approved by Overseas Investment Office for New Forest

	June Year hectares				to date
Survey Region	2018-19	2019-20	2020-21	2021-22	2022-23
Northland	1,175	235	809	1,017	413
Waikato-BoP	650	500	3,711	963	580
Gisborne	0	680	0	2,539	5,669
Hawkes Bay	1,185	3,753	6,076	1,345	2,023
Wairarapa	1,573	2,076	517	2,288	1,631
Taranaki/Manawatu	1,000	3,500	0	0	0
North Island	**5,583**	**10,744**	**11,113**	**8,152**	**10,316**
Nelson-West Coast	0	0	0	0	0
Marlborough	0	1,690	5,300	0	0
Canterbury	0	0	0	1,560	413
Otago	0	1,074	0	3,858	310
Southland	0	0	2,145	1,275	1,988
South Island	**0**	**2,764**	**7,445**	**6,696**	**2,711**
Confidential/unassigned				859	
New Zealand	**5,583**	**13,508**	**18,558**	**14,848**	**13,027**
Cumulative North Island	5,583	16,327	27,440	35,592	45,908
Cumulative South Island	0	2,764	10,209	16,905	19,616
Cumulative Confidential/unassigned	0	0	0	859	859
Cumulative New Zealand	5,583	19,091	37,649	53,356	66,383

Source Beef + Lamb New Zealand Economic Service & Insights, Overseas Investment Office (OIO)

Some of the OIO approvals state delayed planting times of up to two years until tree seedling stock is available. Further analysis of OIO whole farm sales for afforestation that disclosed the purchase price is summarised in Figure 4 on a purchase price per hectare basis.

Figure 4 Farmland Purchase price per hectare



Note for the North Island from 2019-20 to 2022-23 (April 2023) OIO farmland purchase prices per hectare increased 95% from $8,000 per hectare to $15,600 per hectare. Likewise South Island OIO farmland purchase prices have increased 84% from $5,600 per hectare to $10,300 per hectare.

Table 3 in conjunction with Figure 4 shows the correlated impact that the increasing NZU price has had on farmland purchase prices for afforestation. While the OIO approved purchases were not the whole market, the OIO approved purchases of farmland to afforest had to compete with the domestic market and vice versa. Hence the OIO data source reflects the farmland purchase price trend for afforestation land.

What is significant is that these increased afforestation land prices also will increases the rateable value of surrounding sheep and beef farms. Rateable land values are revised every three years by District Councils reflecting land price sale trends. Depending on how District Councils set their rural rates charge, afforestation land prices have the potential to increase rates for sheep and beef farms on similar country. For some farm businesses, the increase in rates will make businesses less likely to be profitable. This further increases the incentive and likelihood of sale and conversion of sheep and beef land into permanent carbon forestry.

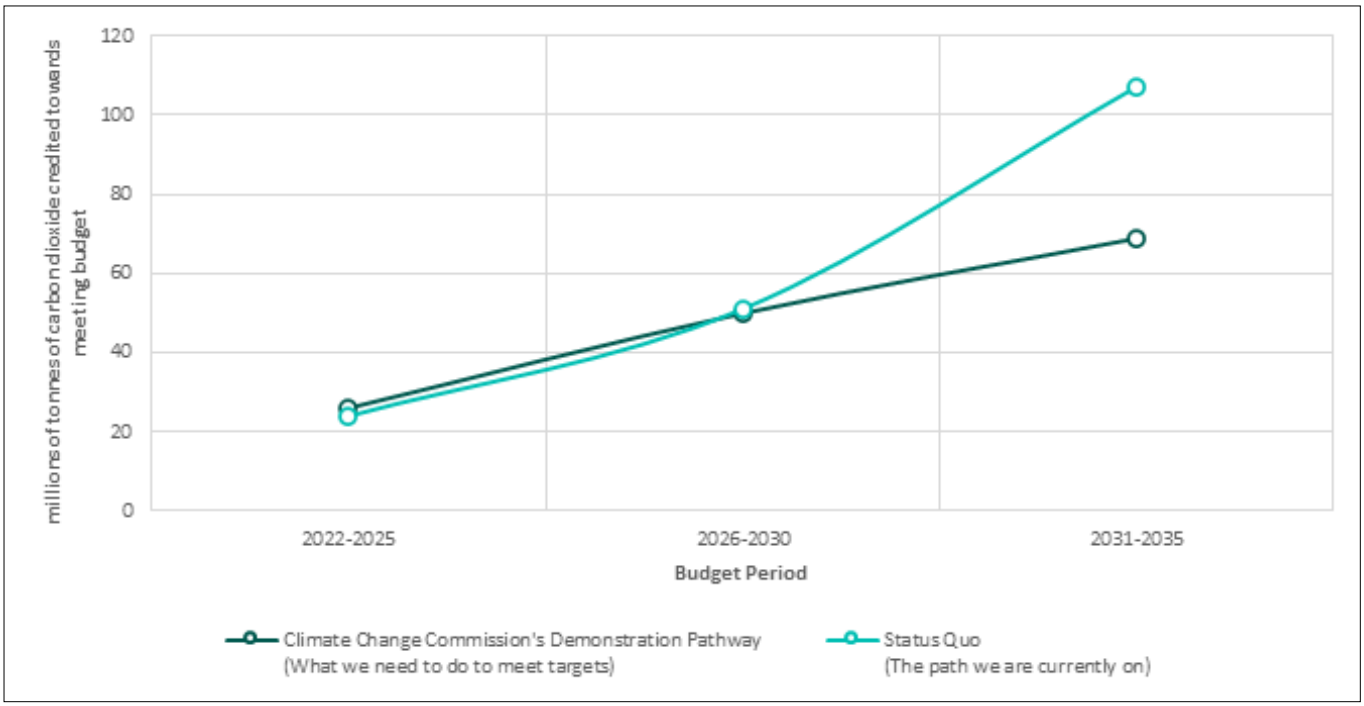
Overshooting on emissions reduction

The evidence suggests that all this afforestation will result in greater emissions reduction than is required, to the point where New Zealand will significantly overshoot short-term targets for gross emissions reduction.

As highlighted in Figure 5, the Climate Change Commission estimates that around 70 million tonnes of carbon dioxide will need to be removed in the third budget period (2031-2035), whereas under the current regime, New Zealand is on course to reduce emissions by well over 100 million tonnes in that period due to exotic planting.

Overshooting targets is likely to create additional negative social, economic, and environmental outcomes, all of which are unnecessary.[14] It also prevents forests from being used to meet future emissions reductions budgets, when it will likely be more challenging to achieve emissions reductions targets in other sectors of the economy.

Figure 5: Comparison of different emissions-reduction pathways



14. CCC (2021).

Why is unrestricted permanent exotic forestry a problem?

Sustained, widespread growth in permanent exotic forestry will generate significant social, economic, and environmental harm, and in many respects goes against the objectives of the ETS.

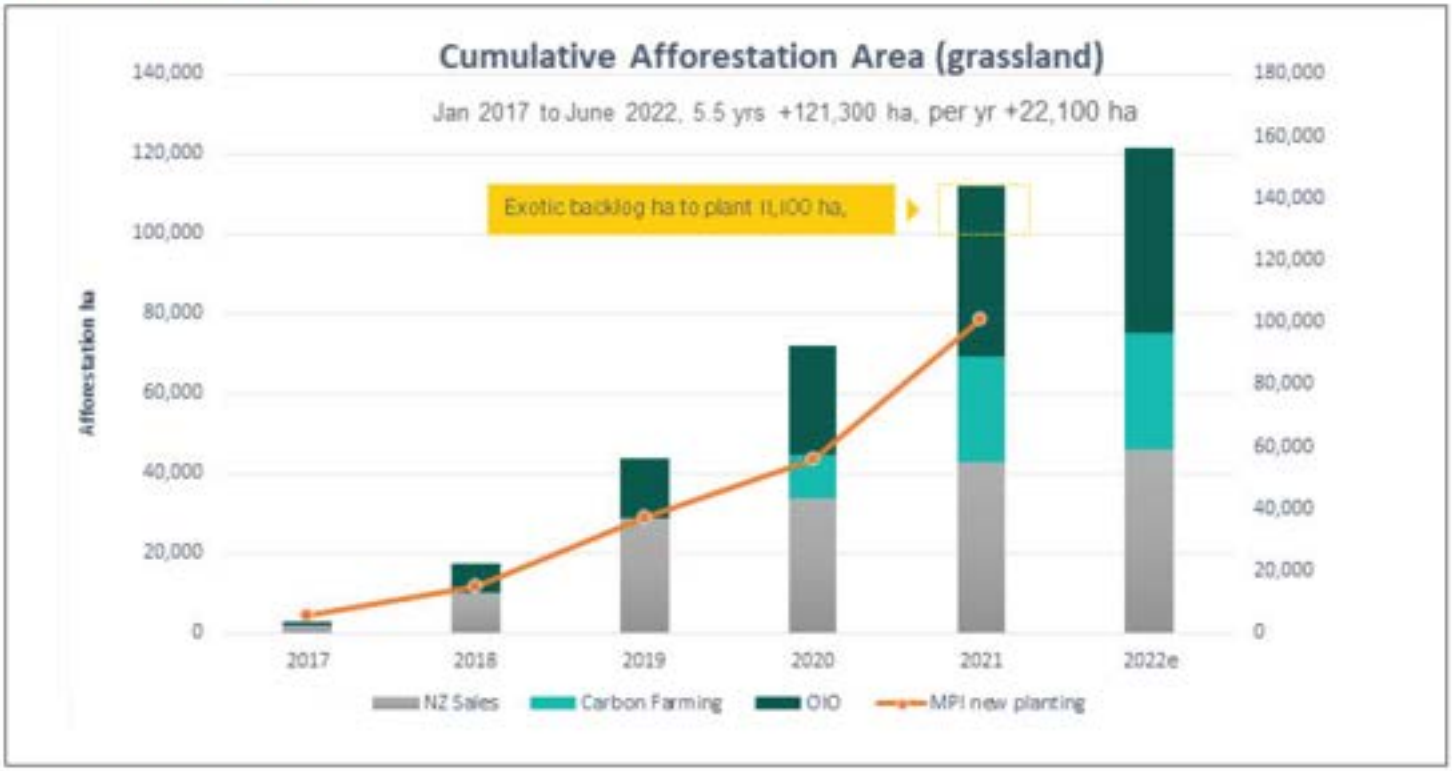
Displacement of productive land uses

As landowners capitalise on current ETS incentives, there is already evidence of a sharp increase in conversions from sheep and beef farms and production forestry to permanent exotic forests.[15]

Research from Orme & Associates identifies the purchases of more than 175,000 ha of whole-farm sheep and beef farmland since 2017 for the purposes of conversion into forestry.[16] Of this area 121,300 ha will be new afforestation on farmland. Most of the remainder of this occupied land area is in existing scrub and woody vegetation. In 2021, more than 52,000 ha sheep and beef land were purchased by forestry interests, a 36% increase on the previous two years, and up from 7,000 ha in 2017. Of the farm area sold to forestry in 2020 and 2021, close to 40% involved was intended for carbon-only farming (i.e., permanent exotic forestry). Incidentally, about the same proportion involved purchases through the Overseas Investment Office.[17]

The line on the chart indicated the estimated area of plantings from tree seedling sales. The area between the line and the top of the bar is indicative of the land area awaiting to be planted.

Figure 6 Afforestation Trend



Source: Beef + Lamb New Zealand Economic Service & Insights, Orme & Associates Limited, Overseas Investment Office, MPI.

15. MPI (2022C).
16. This is a conservative estimate based on analysis of land sale titles and identification of known forestry interests as a purchaser. More farms could have been sold to forestry interests that were not easily identifiable.
17. See Beef + Lamb New Zealand, (2022). *Afforestation report shows whole farms are being converted into carbon forests at alarming rates.*

Growth in conversions will continue in line with the afforestation trend described above and, where those conversions are concentrated, they will have a profound impact on local communities.[18]

Forestry provides sporadic employment from planting to harvest. Permanent carbon farm forestry employs labour for planting with little else from then on. In contrast sheep and beef production provides ongoing farm employment and downstream processing to export or domestic market employment.

Table 4 shows that, for each 100 ha of sheep and beef farmland converted to forestry, an estimated 52 FTE jobs would be removed from the red meat industry over 30 years.

Table 4: Employment FTE: Land use change to forestry[19]

Average FTE per 100 hectares (30 years)	With Harvest	Without Harvest
Forestry FTE	17	7
Red meat industry FTE displaced by forestry	-52	-52
New Zealand net FTE change	-35	-45

Scaling the calculation up to match the levels of exotic afforestation anticipated over the next decade shows that 500,000 ha of new afforestation on sheep and beef farmland would remove over the following 30 years 175,000 FTE jobs if the area was used for production forestry, or 225,000 FTE jobs if used for carbon farming.

This analysis is based on input-output tables and takes account of flow-on employment that support the production from forestry or farm to the local market or export.

For the provincial communities where permanent exotic forestry takes hold, this can only mean a future of de-population, economic decline, and identity loss, as economic and social structures built up over 200 years or more are undone. Together with certain tangata whenua groups, farmers and production foresters have made their concerns about local economic and social impacts very clear during consultation on government proposals to change ETS settings.[20]

Under current settings, once land is converted to permanent exotic forestry, the economics make any future land-use change very difficult. Because of the rate at which permanent exotic forests capture carbon, and the fact that the rules of the Permanent Forestry category require them to remain unharvested for at least 50 years, any landowner looking to convert back to productive land uses faces significant economic consequences as a result of deforestation and foregoing the future allocation of NZUs.[21] Land converted to permanent exotic forestry is, essentially, locked in that land use.

18. BakerAg (2019).
19. Beef + Lamb New Zealand (2020). The economic impacts of converting red meat industry production to forestry.
20. MPI (2022A)
21. MPI (2022B).

What is bad for local economies is, of course, bad for the national economy.

Wholesale conversion to permanent exotic forestry will come at a cost to national employment. Sheep and beef farming indirectly employs an estimated 92,000 people nationally, while production forestry employs around 35,000 people. It will also reduce New Zealand's export earnings: sheep and beef farming and processing generate in the order of $11 billion in export revenue each year, and production forestry about half that amount.[22] In contrast, permanent exotic forestry generates no export revenue.

Reduced land-use flexibility and reduced availability of productive land limits scope for diversification of the primary sector, and this undermines the resilience of the New Zealand economy. A diversified primary sector is better equipped to respond to global and local economic fluctuations and to changing patterns in consumer demand offshore.

Box 2: Māori and forestry

Māori have a very strong connection to forestry – as rangatira, kaitiaki, landowners, forestry owners, forestry workers and business owners.[23] Approximately 30% of New Zealand's 1.7 million ha of plantation forestry is estimated to be on Māori land, with the total expected to grow to 40% as Treaty settlements are completed.[24] Meanwhile, Māori hold a proportionally high level of investment across the primary sector, with the largest concentration of assets in sheep and beef farming.[25]

The issues identified in this report are therefore of particular relevance to Māori. Acknowledging their position as partners of Te Tiriti, the response to these issues must be developed in partnership with Māori.

Feedback from Māori in consultations on potential ETS changes and engagement with Māori forestry sector experts has highlighted a range of views on the role of forestry offsets in the ETS – some echoing the concerns raised in this document about the expansion of exotic forestry, and others voicing strong support for the role of exotics in the permanent forestry category, now and in the future.[26]

Undermines long-term climate objectives

Exotic forests planted now and in the next few years will lead to an abundance of supply of NZUs from the 2030s, lasting for several decades.[27,28] This will flow through into lower carbon prices, which will in turn reduce the incentive for gross emissions reduction.

With less incentive to invest in improvements in energy efficiency, low-carbon technologies, and other initiatives to reduce emissions, the likelihood is that emitters will simply rely on the option of relatively low-price forestry offsets to meet their surrender obligations. This will delay action and increase cumulative emissions.[29]

Equity and integrity

Moreover, it raises important intergenerational equity questions, because it creates a situation where the current generation passes on to future generations responsibility for the difficult and economically painful adjustments that climate change requires. While the benefits of offsetting are often realised in the short-term (i.e., the first 50 years of the forest), the costs and risks are spread over the long-term.

The equity issues are not just intergenerational – the current model undermines the link between those who pay for emissions reduction and those who benefit from it. Wider society bears the cost of the ETS, and many would find it fundamentally unfair that their contributions support a scheme that avoids directly addressing the underlying problem, and that enables rapid wealth accumulation for a relatively small group.

The absence of any constraints on the use of forestry offsets means the volume of NZUs entering the market is determined by the capacity of landowners and foresters to plant trees (and therefore make profit), rather than the need for abatement. Again, wider society may well question the integrity of the scheme, and the fairness of being asked to pay for it.

22. MPI (2022C).
23. MP (2022A).
24. MPI (2022A).
25. MPI (2022A).
26. See Te Taumata (2023) Technical Forestry Report.
27. MPI (2022A); CCC (2023).
28. MfE (2023B).
29. CCC (2021).

Prevents New Zealand from linking with international schemes

As discussed above, the lack of restrictions on forestry offsets in the ETS, and the focus on net emissions, put New Zealand out of alignment with other schemes around the world. This is likely to prevent the ability for New Zealand to link its ETS with others, and to draw on the benefits that come from access to larger carbon-trading markets and liquidity.[30] As well as generally higher costs in the national emissions-reduction effort, this could mean New Zealand may struggle to attract foreign investment into low-carbon technologies (because it cannot participate in a global carbon market), and that New Zealand businesses that operate in multiple jurisdictions face regulatory barriers and higher compliance costs.

Potential environmental harm

Exotic forestry has the potential to cause harm to the surrounding ecosystem in a number of ways. The potential impacts apply to both plantation and permanent forestry, though the impacts are likely to be greater from permanent exotic forestry, as that has not been subject to any national policy standards to date.

Most notably, there are concerns that permanent pine forestry may increase the risk of fire, erosion, disease, pests, and the spread of wilding pines.[31]

Cyclones Hale and Gabrielle have highlighted just how vulnerable fast-growing, heavy exotic species can be during extreme weather events, especially when planted on steep, erosion-prone land. A report commissioned by the Hawkes Bay Regional Council found almost half (48%), of the large wood debris volume measured originated from pine plantation forests, and 38% of the volume was from flood-protection willow or poplars. In total, at least 86% of the large wood debris volume measured originated from unstable, erosion-prone landscapes that vegetation was planted to protect.[32]

Trees brought down by wind and rain are an extreme risk to people, property and infrastructure.

Permanent exotic forestry is still a relatively recent new land-use option and its implications will only be properly understood with time and greater experience.[33] As noted above, the model is based on an expectation that the exotic pines (which have an average lifespan of 80-90 years) will degrade over time and, in the meantime, native forest will naturally grow up underneath and become a self-sustaining forest.[34] Scientists are divided, however, on whether this will in fact happen, with a number of them highlighting that pines typically supress undergrowth. If regeneration does not take place, permanent exotic forestry would leave New Zealand's countryside scattered with degenerating and decaying exotic pines.

Without careful management, exotic forests can harm biodiversity if they are planted at the expense of indigenous habitats for flora and fauna. During the last decade, for instance, exotic afforestation is understood to have caused a 4,000 ha reduction in indigenous scrub and shrubland.[35] Indigenous forests support thousands of native species, many of which are endangered – exotic forests do not come remotely close to matching this scale of biodiversity.

30. Diaz-Rainey and Tulloch (2018)
31. MPI (2022B).
32. Interpine Innovation (2023). Cyclone Gabrielle: Post Event Wood Debris Assessment – Hawke's Bay.
33. MPI (2022B).
34. MPI (2022C).
35. MPI (2022A)

What can be done about it?

If left unchecked, the current structure of the ETS will set New Zealand back economically, socially, and environmentally, and the time for policy change is now.

Today's choices will shape New Zealand's land use patterns long into the future, and action must be taken as soon as practicable, before the economic and environmental costs are too great to remedy. Decisions made today are locked in for the lifespan of the forest because of the nature of the sector, and the life-cycle of trees.[36,37]

Policy options – longlist

There are a number of policy options at the Government's disposal to drive the change that is required, many of which have been put forward in previous advice from officials and stakeholders.

First, we considered wider changes to the New Zealand ETS and forestry settings. There are many options to limit the supply of forestry units into the scheme as well as the demand for (or use of) these units by emitters. Setting changes will need to ensure that incentives in the New Zealand ETS align with emissions reduction targets. Ideally, settings would also support adoption of planting types and rates as recommended by the Climate Change Commission. Making these setting changes in practice could be challenging to complete given the technical and political nature of many of the options. Broader ETS forestry settings we considered included:

- Limiting the supply of forestry units in the scheme;
- Restricting demand by altering the exchange rate for Forestry NZUs or requiring additional levies for forest units;
- Limiting the proportion of forestry units that emitters can surrender; and
- Moving forestry out of the ETS into a separate project-based mechanism or a separate methane/tree offset market.

In addition to changing the 'supply' and 'demand' forestry related settings in the scheme, there are other levers in the ETS that could be used which could influence forest planting as driven by the New Zealand ETS. These changes aim to align incentives with emission reduction targets, but their implementation might be challenging due to technical and political factors. The options we considered included:

- Limiting the ability to bank forestry NZUs; and
- Opening forestry NZUs to other countries' ETSs. These options could further influence forest planting driven by the New Zealand ETS.

Finally, we considered amendments to the Permanent Forestry Category to limit the entry or participation requirements of those entered in, or entering into, the permanent forest category of the New Zealand ETS. Changes to this category could be made faster than other wider changes to the New Zealand ETS but will not prevent further planting of production forests from displacing gross emissions reductions. The permanent forestry category, proposals we considered included:

- Limiting the entry or participation of certain entities;
- Implementing restrictions on exotic species, possibly with exceptions;
- Imposing bond requirements for those establishing exotic forests transitioning into natives;
- Limiting the amount of land eligible for this category; and
- Introducing a standards regime for all participants.

36. MPI (2022B).
37. MPI (2022C).

Policy design principles

The list of options was narrowed down to a shortlist by applying the following policy design principles:

i. **There is no silver bullet – target the area of greatest need**. No single policy initiative will address every problematic aspect of forestry offsets in the ETS. The Government must prioritise initiatives that address the areas of greatest urgency, and that can have the greatest impact. Permanent exotic forestry is quickly emerging as the major driver of afforestation, and initial policy interventions must focus on rebalancing ETS incentives so they do not weigh so heavily in favour of permanent exotic forestry. While, as noted by the Climate Change Commission in its most recent draft advice, it is likely that more fundamental changes to the ETS will ultimately be required if we are to focus on gross emissions,[38] these changes will be more complex and will take longer to develop and implement. They should be approached as a 'slow burn', in the context of a wider conversation about the role of forestry in New Zealand's climate change response.

ii. **Avoid extremes**. In remedying the current system, we must not swing from one extreme to the other; that is to say, from a zero-restrictions framework to a complete ban on forestry in the ETS or exotics in the permanent category in the ETS. There is still a critical role for contained and controlled permanent exotic forestry to play if New Zealand is to achieve its emissions reduction targets – the trick is to make sure that role is part of a scheme that works in the best interests of local communities and the country as a whole.

iii. **Recognise the need for nuance**. Getting the best possible outcomes for New Zealand will require a flexible framework, and practical, balanced solutions (including, among other elements, sensible exemptions).

iv. **Listen to the experts**. The issues broached in this report have already been considered by government officials, in particular MPI and the Climate Change Commission, and the strong recommendation is that ETS incentives must be moved away from including exotics in the permanent category of the ETS.

v. **Address both supply and demand**. The current situation involves two separate market failures in the ETS; one on the supply-side and one on the demand-side. No single intervention will suffice, and policy levers must be pulled that both limit the volume of NZUs that can be generated (supply-side interventions), and control how those NZUs can be used once in the system (demand-side interventions).

Policy shortlist

Based on these principles, we propose a shortlist of six policy options which are examined in greater detail, consisting of four supply-side options and two demand-side options. Most of these options focus on changes to the permanent forest category of the NZ ETS, reflecting the fact that the permanent exotic forestry represents the area of greatest need for reforms.

The supply-side options are:

Option 1: Restrict exotic forestry in the New Zealand ETS

This option proposes to remove the ability to register any new exotic forestry in the New Zealand ETS entirely. This would mean that new exotic forestry (such as Pinus radiata, other conifers, or exotic hardwoods) would not be eligible to be enrolled in the New Zealand ETS for afforestation of deforestation activities.

For the avoidance of doubt, new indigenous forestry could continue to enrol in the New Zealand ETS, because these species contribute to indigenous, restorative, and regenerative biodiversity for New Zealand.

Option 2: Remove exotics from the Permanent Forestry Category (with exemptions)

Under this option, exotic species would no longer be able to register in the Permanent Forestry Category, except under specific circumstances.

Those circumstances could include situations where controlled exotic planting will deliver environmental or economic benefits that would otherwise not be possible, such as on erosion-prone land or on marginal land where no productive activity is possible, or where it will help the Crown to achieve its Te Tiriti obligations (noting that Māori freehold land has

38. CCC (2023).

different characteristics to general title land which can make it well-suited to permanent forestry). [39]

Exemptions could also include a 'grandparenting' approach to exotic forestry currently registered in the Permanent Forestry Sink Initiative, which would allow exotic forestry from that category to transition into the new Permanent Forestry Category.

Option 3: Reduce the rate at which exotic forestry earns NZUs

This option would involve reducing the carbon stock rate for permanent exotic forestry – that is to say, the rate at which NZUs are earned for every tonne of carbon captured. The suggestion for further investigation to reduce the carbon stock rate was part of the Climate Change Commission's 2021 report.[40]

Option 4: Limit permanent exotic forestry by land area

This option would see a limit placed on the overall area of permanent exotic forestry that could be registered in the ETS each year. While the Climate Change Commission suggested limiting the overall area of all types of forestry, this approach would maintain an incentive to plant permanent indigenous forests, which avoid many of the potential negative impacts of exotic forests, as discussed above.[41]

The demand-side options are:

Option 5: Permanent exotic forestry levy

This option proposes to introduce an additional levy on ETS participants who surrender permanent exotic forestry units. The levy should be based on a nominal figure, rather than a proportion of the value of an NZU, given the likelihood of significant increases in the value of NZUs in the future (which may make the levy unworkable).

The levy on exotic forestry emissions serves three primary roles:

1. It provides a funding mechanism for alternative emission reduction activities, like nature-based or indigenous forestry methods, and research into innovative emission-reducing technologies.
2. It internalizes external costs of potential environmental events associated with exotic forestry, such as clean-ups post natural disasters. This inclusion of external costs gives a more accurate reflection of the true cost of exotic forestry activities.
3. With NZUs being fungible for New Zealand ETS surrender obligations, the levy could decrease demand for units from exotic forestry, thus encouraging the surrender of other types of NZUs, diversifying overall emission reduction efforts.

Option 6: Limit permanent exotic forestry offsets, as a proportion of total NZUs surrendered

This option would see a limit placed on the use of permanent exotic forestry offsets, as a proportion of the total units surrendered by ETS participants each year. As noted above, offset limits are a common feature of carbon-trading schemes around the world and are typically set in the 1-10% range. For reasons of consistency, we recommend that a similar range be considered in the ETS.

39. MPI (2022A).
40. CCC (2021).
41. CCC (2021).

Assessment criteria

In order to compare the options against each other, and to identify preferred options, a high-level assessment of the shortlisted options was conducted, based on an assessment criterion developed by MPI (to assess policy tools to manage exotic afforestation incentives).[42] The criteria include the following:

- Meets emission budgets and targets;
- Supports gross emissions reductions;
- Supports regional economies and jobs;
- Contributes to gross domestic product (GDP) and purchasing power parity (PPP);
- Enables Land flexibility;
- Preserves the integrity and operation of the ETS;
- Long-term strategic focus;
- Provides environmental benefits;
- Supports indigenous biodiversity;
- Fair and level playing field for all;
- Speed of implementation; and
- Alignment with international schemes

The full assessment for all six policy options is attached in **Appendix 1**.

Preferred Options

The assessment shows that, among the supply-side options, Option 2 performs most strongly against the criteria, while the same is true of Option 6 on the demand-side. Our two preferred options, therefore, are:

- ***Option 2: Remove exotics from the Permanent Forestry Category (with exemptions); and***
- ***Option 6: Limit permanent exotic forestry offsets, as a proportion of total NZUs surrendered***

Impact analysis

Based on the high-level analysis, it is our view that the combination of Options 2 and 6 would address many of the problems generated by the current incentives for forestry offsets in the ETS and provide the basis for an approach that can bridge divergent stakeholder views and achieve consensus on the way forward. The most important impacts can be described as follows:

i. **Reduced displacement**. The current wave of conversions to permanent exotic forestry would be cut short. Relative to the status quo, more land would remain in sheep and beef farming and in production forestry, which would support growth, employment and social cohesion for local communities, and support GDP growth and export receipts at the national level.

ii. **Emissions targets met, without overshooting**. New Zealand could achieve its net emissions reduction targets, over the next 15 years and through to 2050, without significantly overshooting the mark. Pathways with little or no overshoot are more likely to deliver the best overall social, economic, and environmental outcomes. [43]

42. MPI (2022C).
43. CCC (2021).

iii. **Flexibility**. Landowners would retain the ability to switch between land uses, whether production forestry, permanent indigenous forestry, farming of some kind, or otherwise. This would support primary sector diversification, and the economic resilience of the wider New Zealand economy. Allowing permanent exotic forests to be planted in situations where no other return was available would maximise the economic opportunity for rural communities, and for New Zealand.

iv. **Better allocation of the cost of climate change**. By limiting the supply and demand for permanent exotic forestry offsets, the ETS would be geared more towards gross emissions reduction; a stronger link would be established between those who pay for emissions reduction, and those who benefit from it. However, other additional changes would likely be required to achieve the desired 'balance' between emissions reductions and removals.

v. **Alignment with international schemes**. The structure of the ETS (in terms of the use of offsets) would be brought closer to that of other schemes around the world, noting some significant differences regarding the inclusion of forestry in the scheme generally would still remain. Linking would enable ETS participants to benefit from access to the global market for tradable units, which would have benefits to the economy.

vi. **Environmental benefits**. New Zealand would avoid many of the negative environmental and resilience impacts associated with permanent exotic forestry (debris, fire, disease, pests, the spread of wilding pines). Meanwhile, the role of indigenous forestry would increase significantly (for carbon farming and, potentially, for harvest), bringing benefits in terms of the diversity of native flora and fauna.

As noted in policy design principle (i) above, these policy options should form the basis of the immediate response and should be rolled out while work is undertaken on more fundamental changes to the ETS.

More detailed research, including economic modelling, will be required to quantify the impacts, and we recommend that this form part of the next phase of analysis.

Implementation

Law changes

The two preferred policy options would require a number of changes to the domestic legal framework around climate change, and should be subject to a thorough cost-benefit analysis. Option 2 would require amendments to the Climate Change Response Act 2002 (Climate Act), to establish exemptions, update the definition of 'permanent forestry', and provide for treatment of future forest compositions (the Climate Act currently defines forests based on the predominant species in a hectare).

Following on from this, the Climate Change (Forestry) Regulations 2022 would need to be amended to reflect the requirement for evidence of forest species, and forests would need to be checked upon registration as well as on an on-going basis to ensure native transition.

Under Option 6, amendments to the Climate Act would be required to provide for the surrender of different types of NZUs, and to restrict the quantity of certain types of NZUs being surrendered (those relating to permanent forestry). The Environmental Protection Agency's existing categorisation of NZUs would provide a useful starting point for the development of this framework.

International obligations

New Zealand's climate change obligations under international law are determined by our Nationally Determined Contribution (NDC), which sets our domestic emissions reduction target. Providing, as anticipated, those targets are met through to 2030, the two preferred policy options would not affect our commitments and obligations under the Paris Agreement 2016, and thus no amendments to the NDC would be required.

Moratorium

We recommend that a moratorium be put in place to restrict the Permanent Forest Category to indigenous forests while the exemptions included in Option 2 are worked through. This would allow for the changes to become effective immediately, while giving the Government time to consider where and what types of exotic forests are desirable in the category.

The moratorium could be structured in a number of different ways. For instance, it could end automatically after a certain period; alternatively, it could require a decision to be made at the end of the period about whether to end or continue. [44]

Timeframe

Following the cost-benefit analysis recommended above, we expect that the law changes could be drafted and enacted within 12 months. The Government has already consulted extensively on proposals like these.[45] Realistically, the time required to implement these changes is down to the will of the Government of the day.

44. MPI (2022C).
45. See Cabinet Minute *New Zealand Emissions Trading Scheme: Next Steps on the Permanent Forest Category* (19 September 2022) CAB-22-MIN-0390.01.

Next steps

Through the release of this report, B+LNZ seeks to set in motion a national discussion on the role of forestry offsets in the ETS. With that in mind, we recommend the following steps be taken.

Stakeholder engagement

B+LNZ should seek to move as quickly as possible to socialise the report with key stakeholders, including:

- Relevant government agencies – MPI, Te Uru Rakau – New Zealand Forest Service, Climate Change Commission, Environmental Protection Agency;
- Māori (iwi forestry trusts, in particular);
- Production foresters;
- Carbon farming interests; and
- Rural communities where conversions to permanent exotic carbon farming have been concentrated

The purpose of the engagement will be to build awareness and understanding of the concerns raised in this report and obtain feedback on the proposed policy approach. Stakeholder insights will shed light on how the policy options will need to be refined to deliver the best possible outcomes and secure broad-based support for action.

The need for engagement of this kind is all-the-more pressing, given divergent and often strongly held stakeholder views on the matter.

Further analysis

At the same time, we recommend that B+LNZ work closely with the officials (including MPI, MfE, and the Environmental Protection Agency) to further develop key aspects of the report, in particular the detail around the preferred policy options. As noted above, in-depth economic analysis is also required as soon as practicable, to better understand the impacts of the proposed policy options.

Wider discussion

In presenting a solution to one of the most obvious and pressing shortcomings in the design of the ETS, this report points to, but does not seek to address, fundamental questions about our approach to reducing emissions: namely, what is the role of emissions pricing as part of a climate change response, and how should New Zealand strike a balance between net and gross emissions reduction? The Government is currently considering whether ETS changes are needed to provide a stronger incentive for businesses to transition away from fossil fuels, while also supporting greenhouse gas removals.[46]

Second, what role should forests, and forestry offsets, play in emissions reduction? Is it appropriate to continue to rely on forestry in the way we have? What alternative models exist? Looking ahead, what is the optimal mix of forest types – permanent and harvest, indigenous and exotic? How can we ensure that those foests complement, rather than simply co-exist with, sheep and beef farming, and other productive land uses?

B+LNZ should use this report as the catalyst for a discussion on these underlying, strategic issues.

46. See MfE (2023A).

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Appendix 1: Assessment of short-listed policy options

	Supply-side options				Demand-side options	
Criteria	Option 1 Restrict exotic forestry from the New Zealand ETS	Option 2 Remove exotics from the Permanent Forestry Category (with exemptions)	Option 3 Reduce the rate exotics forestry earn units s	Option 4 Limit the overall area of forestry registered in the New Zealand ETS	Option 5 Exotic forestry levy	Option 6 Limit permanent exotic forestry offsets, as a proportion of total NZUs surrendered
Meets emission budgets and targets	-	+	+	+	+	+
	May undershoot emissions later budgets without more gross emission reductions	Can manage exemptions to optimally achieve emissions budgets	Can manage exemptions to optimally achieve emissions budgets	Can manage exemptions to optimally achieve emissions budgets	Forestry fee can be managed to optimally incentivise planting to meet emission reduction budgets	Limits can be managed to meet emission reduction budgets
Supports gross emissions reductions	+	+	0	0	+	+
	Limits oversupply of forestry units to incentivise gross emission reductions	Incentivises more gross emission reductions instead of net reductions	Incentivises net emissions, not gross emissions	Incentivises net emissions, not gross emissions	Increases incentives for gross emissions reductions	Increases incentives for gross emissions reductions
Supports regional economies and jobs	+	+	+	+	+	+
	Creates jobs by encouraging production forestry and/or sheep and beef farming	Creates jobs by encouraging production forestry and/or sheep and beef farming. Exemptions can tailor for regional characteristics	Reduces incentive both permanent and production forestry, but incentivises alternative, productive land uses that creates more jobs	Reduces land available for permanent and production forestry, but incentivises alternative, productive land uses that creates more jobs	Reduces incentive both permanent and production forestry, but incentivises alternative, productive land uses that creates more jobs	Indirectly incentivises alternative, productive land uses that creates more jobs
Contributes to GDP and PPP	++	+	+	+	+	+
	Improves GDP via increased production forestry and/or sheep and beef farming exports	Improves GDP via increased production forestry and/or sheep and beef farming exports	increased incentive for alternative land uses	Exotic forestry provides little GDP contribution per hectare on registered land. Increases land availability for other uses.	Reduces incentive both permanent and production forestry, but increases incentives for alternative land use which contribute to GDP	Lower demand for permanent exotic units incentivises alternative, productive land uses that contribute to GDP via exports
Land flexibility	++	+	+	-	+	+
	Encourages land used for most productive purposes, beyond ETS incentives.	Encourages productive use land where viable. Minimises the risk of future sunk costs. Exotics can be exempted where suited	Can increase land flexibility if NPV per hectare comparable with competing land uses	Limits land-use options where forestry may be of some benefits, such as preventing soil erosion. Existing forestry land might artificially increase in value given it's scarcity, reducing land flexibility further.	Encourages land to be used for most productive purposes beyond solely ETS price signals	Encourages land to be used for most productive purposes beyond solely permanent exotic planting
Preserves the integrity and operation of the New Zealand ETS	++	+	+	0	+	+
	Prevents oversupply of units and suppressed NZU prices from uncontrolled exotic forestry	Unit oversupply, stockpile and price suppression from uncontrolled exotic forestry can be managed.	Can limit unit oversupply and NZU price suppression	Does not affect the incentive to plant more exotics, but restricts the number of overall forestry units	Reduces the skewed incentives for permanent exotic forestry, which provides more efficient price signals for emissions	The ETS moves closer to a cap and trade system by reducing financial incentives to plant permanent exotic forestry. Other units for all participants can be procured via primary auctions and allocations

Long-term strategic focus	+	+	-	-	+	+
	Incentivises long-term, intergenerational, and native forestry carbon sinks	Incentivises long-term, intergenerational, and native forestry carbon sinks	Any exotics remains one-off, short-term solution with a shorter forest life than natives	Any exotics remains one-off, short-term solution with a shorter forest life than natives	Slightly reduces the incentives for short-term, exotic forestry plantation	Drives gross emissions reductions, but retains an incentive for productive and/or indigenous forestry
Provides environmental benefits	+	++	+	+	+	+
	Reduces pest, disease, fire, and wilding risks	Reduces pest, disease, fire, and wilding risks. Exotics can be planted in erosion prone regions	Could reduce the extent of exotic plantation and therefore pest, disease, fire, and wilding risk	Slows down the spread of pest, disease, fire, and wilding risk from exotic forests	Reduces exotic forestry incentives therefore associated risks	Reduces risks associated with permanent exotic forestry
Supports indigenous biodiversity	++	++	+	0	++	++
	Reduces incentive for monoculture forests. Native forests can be incentivised via the New Zealand ETS	Reduces incentive for monoculture forest. Native forests can be incentivised via the New Zealand ETS.	Could disincentive exotic forestry planting and therefore create space for indigenous forests	Does not affect the incentive to plant more exotics	Provides some financial incentive for indigenous forests and biodiversity. Exotics levy can be recycled to support indigenous biodiversity programmes	Reduces incentive for monoculture forest. Native forests can be incentivised via the New Zealand ETS.
Fair and level playing field for all	++	++	+	--	+	+
	Limits skewed incentives for permanent exotic forestry	Limits skewed incentives for permanent exotic forestry	Could be amended to make exotic forests comparable to other land uses	Does not address the skewed financial incentives for exotic forestry. Determining eligible land can create inequality among foresters	Can better align the incentives among exotic forestry with alternative land uses	Limits skewed incentives for permanent exotic forestry
Speed of implementation	--	+	--	--	-	-
	Likely challenging to implement due to blunt solution	Exemptions can be tailored to unique circumstances	Likely challenging to implement due to blunt solution	Likely to be challenging to implement due to displacing native forests	Likely to face strong challenges from New Zealand ETS market participants	Likely to face strong challenges from New Zealand ETS market participants
Alignment with international schemes	+	++	-	-	--	++
	Closer alignment to international ETS settings	More comparable with international ETS allow a small amount of forestry offsets.	Carbon stock accounting would not align with international measures	Most ETS limit the use of offsets, rather than issuance of offsets	Does not align with most ETS designs	More comparable with international ETS allow a small amount of forestry offsets.
Overall recommendation	+	**(Preferred)++**	-	-	+	**(Preferred)++**
	Improves ESG, but is a blunt solution	Improves ESG outcomes and can be tailored to unique circumstances. Continues to incentivise native afforestation.	Could reduce the incentives to plant exotics but does not support long-term emission reductions	Does not address the skewed incentives to plant exotic forests. Can create inequality among landowners.	Likely to reduce the future oversupply of exotic forestry units. Provides some incentive for productive land use and indigenous biodiversity. Exotics levy can be recycled to support indigenous biodiversity programmes	Likely to reduce the future oversupply of permanent exotic forestry units. Drives gross emission reductions. Reduces risk of sunk cost permanent exotic forestry.

Submission to the Ministry for the Environment Emissions Trading Scheme (ETS) Review

Prof Troy Baisden

11 Aug 2023

This is a personal submission representing my capacity as an expert and researcher working on climate change for 29 years. My principal area of expertise is biogeochemistry – with a focus on the accounts of carbon, nitrogen and water in natural and managed ecosystems. I focus on the interaction between science, policy and economics in climate change, water and other areas of environmental science related to land use, as well as the leadership of multidisciplinary projects related to environmental management. I came to New Zealand over 20 years ago to work in and eventually lead the initial implementation of soil carbon accounting.

I emphasise the transdisciplinary breadth of my expertise and overview of the long-term trajectory of policies such as the Emissions Trading Scheme (ETS). I am currently an honorary Professor in the University of Auckland School of Environment, a Principal Investigator in Te Pūnaha Matatini (TPM) Center of Research Excellence, and an affiliate at Motu Economic and Public Policy Research Trust. I have over 80 peer-reviewed journal publications in the areas I note above, and am Co-President of the New Zealand Association of Scientists. I serve on MBIE Reference Group for Te Ara Paerangi (Research, Science and Innovation Reform) and MfE's Interim Ministerial Advisory Group Limits and Targets which allowed me to compare climate change policy to proposed frameworks for the NBEA Bill. Consideration leading to this submission has been supported by TPM's Observatory project, which scans for issues where improved understanding of complexity can create better, simpler solutions of benefit to our nation. This submission is in my individual capacity and does not represent any organisations I am affiliated with.

Summary and Main Points:

1) A series of mis-steps – including this Review and Consultation – have undermined confidence in the integrity of Emissions Trading Scheme (ETS) as a component of Aotearoa New Zealand's policy pathway to meet its Nationally Determined Contribution (NDC) and national carbon budgets consistent a world with the stable climate a majority of New Zealanders and the nations we trade with support.

2) A central problem is that the ETS is poorly understood and poorly explained, even by those in Government charged with its care. It is seen as addressing multiple, potentially incompatible goals. The purpose of the ETS must be simplified and clearly stated. Other purposes should be separated, outside the ETS, and clearly stated. An ecosystem of many policies and tools contributing to emissions reductions will function better if each policy makes sense to those it touches.

3) The ETS must remain a foundation of New Zealand's toolbox for achieving emissions reductions. Modelling undertaken for this review and all available evidence shows me clearly that the ETS settings alone can not achieve the required emissions reductions. If this was possible historically, it is no longer possible in a political environment characterised by a 'cost of living crisis'. Incentives are needed, and are essential to support innovations to reach competitiveness with the status quo.

4) I am not convinced of any need for a deep repackaging of the ETS. If there are separate purposes or issues – such as those associated with gases having short versus long atmospheric lifetimes (e.g. CH_4 vs CO_2, N_2O, etc), or gross vs net emissions – these should be dealt with by simple, well-formed, understandable policies acting outside but designed to interact with the ETS. I am increasingly of the opinion that a single price that is comparable internationally is most desirable, but that many activities can *stack* other incentives on top of the ETS price.

5) Stacked incentives that encourage gross emissions reductions from sectors such as transport and industrial energy use can (and already do) draw on the fund created by a stable stream of ETS auction revenue. Approaches to the policy problems of incentivising biodiversity and mitigating the regressive impacts of emissions pricing on households can be dealt with in this way. Coming from and comparing to US environmental science/policy and international approaches to emissions reductions, Aotearoa New Zealand has been unnecessarily slow and resistant to consider or widely implement incentives, and must reconsider to remain competitive internationally for investment and trade.

6) It also appears to me that consideration of equity and Te Tiriti issues for iwi/hapū, Māori organisations and Māori land are best dealt with by continuing the existing ETS and designing separate interacting policies. Some related policy systems may also need to be better aligned over time, particularly those that also create barriers or dilemmas such as the electricity market. Consultations should be integrated where possible.

7) Policies should be developed with improved accountability through evaluation criteria that clearly and proactively assess whether the policy (including the ETS) is creating a stable policy pathway that encourages actions to reduce emissions. The multiple mis-steps indicate that an improved understanding of the boundaries of stability of policy pathways must be understood, and guardrails built or warning signs identified. This should include the development of appropriate research, science and innovation capability through reforms including Te Ara Paerangi (MBIE), most likely as part of the National Research Priorities.

To conclude:

- Work to simplify, improve and communicate the ETS as a tool that contributes to the push toward both gross and net emissions reductions.
- Do not overload expectations on the ETS that are best left to related policies.
- Incentives are needed and should sit outside the ETS, but can be funded by ETS auction revenue.

Expanded detail related to some points above

Regarding (1) above, the mis-steps I refer to include

- The December ETS settings agreed to by Cabinet, not compatible with Climate Change Commission advice, and now reversed following judicial review. These settings, for example, undermined the effectiveness of the 'cap' implied as a pathway in the ETS by setting the Cost Containment Reserve at levels likely to be triggered routinely when this is not their intention in the design of the ETS.
- The inclusion of clause 15 in Climate Change Response (Late Payment Penalties and Industrial Allocation) Amendment Bill. This clause was signalled as a minor technical amendment but would have substantially expanded free allocation at a time when the pre-NDC free allocation policy is no longer appropriate. The scope of the clause was identified by submissions to the Environment Select Committee and the report to Parliament has recommended its removal.
- This consultation also appears to be a needless and unwelcome cost to experts, activists and NGOs and particularly to Māori who would need to consider Te Tiriti implications of sweeping but poorly constrained options.

Across all of these cases, there is a pattern of policy analysis identifying options, developing competing policies, but neither running the numbers in an integrated way nor engaging with experts and the RSI system, including the need for funding and long-term development of the needed expert capability, models and datasets to answer policy questions on policy timescales. Putting complex issues out for public consultation without appropriate research and modelling is not appropriate.

Regarding (2) above, I refer to Christina Hood as having written and spoken clearly about the problem of multiple competing or incompatible goals. I note there is a general and developing international concept of environmental integrity. This includes ecological integrity (the function of the natural environment) but more importantly the integrity of the policies, markets and regulatory systems that contribute to our decisions about the environment. I encourage the development and use of this concept to inform the use of values and principles to build the ecosystem of policies. Many policies need to be outside the ETS but interact with its pricing to form a stack of incentives or factors influencing decision making. Environmental integrity provides a framework for achieving an effective policy system built from many component policies. It enables this to be achieved without attempting to turn any component policy or policy sub-system (such as the ETS) into a multi-headed monster that no-one can understand or interact sensibly and predictably with.

Regarding (3) above, I note that Figure 5 in the modelling paper provided to support this consultation demonstrates that higher prices lead to more emissions reduction, but with path dependence set by initial price expectations. Despite this, the CCC Demonstration Path or other 'scenarios' do not differ from the 'current policies' paths sufficiently (e.g. Figure 2 and more complex figures) to support the suggestion that the ETS alone will deliver NZ's carbon budget. Incentives and price expectations can achieve more. However, the hope of stable and high ETS pricing not undermined by political considerations has been undermined. Further consideration of incentives is needed to repair the progress toward mitigation lost in recent months as the ETS price and future confidence has collapsed. I note that I've been

involved with startups such as Toha working to convert confidence in future prices into action, and I do not think the impact of the collapse of confidence should be underestimated.

Regarding (4), the Biodiversity Credits incentive programme represents an example currently under consideration. I also refer to the proposal for split gas targets as well as policies that may enable agricultural emissions pricing to come online over time and interact with other policies active on farms, such as those that may capture the value of carbon accumulated in plantings. This also contributes to (5) as an example.

For (6), it is important to be clear that Māori land is largely forested and often was forested or underdeveloped at the time of Treaty Settlements. It is subject to constraints and stewardship principles that may limit its use and must be considered separately from freehold land in all policies that may spread across a spectrum that includes 'grandparenting' of land use or other emissions.

Regarding (7), I note that I was a leader in research initiatives funded by FRST (a predecessor to the RSI funded by MBIE today) which coordinated research across the major research providers to begin to build models that could analyse major mitigation policy options across our productive sectors as well as indigenous vegetation. These areas of work were no longer coordinated or mapped in National Science Challenges from 2013 onward. We are left with an uncoordinated wild west of small to medium size projects or single individuals or small teams lacking evaluative or innovation pressure or integration. Although Te Ara Paerangi may support future progress through the proposed development of National Research Priorities, yet there remains a lack of clarity of whether significant targeted policy support should be funded by the policy agency (e.g. MfE or Vote Environment or Climate Change) or by MBIE through Vote Research, Science and Innovation.

Submission by

to the

Ministry for the Environment

on the

The Review of the Emissions Trading Scheme (ETS)

11 August 2023

– A BUSINESSNZ AND BUSINESSNZ ENERGY COUNCIL (BEC) SUBMISSION – THE REVIEW OF THE EMISSIONS TRADING SCHEME (ETS)

Introduction

1. BusinessNZ and BusinessNZ Energy Council (BEC)[1] welcomes the opportunity to provide feedback to the Ministry for the Environment (referred to as 'the Ministry') on its consultation document titled the Review of the Emissions Trading Scheme (referred to as the 'Review'). This review outlines some of the benefits, risks, and trade-offs of changing the NZ Emissions Trading Scheme (ETS) to incentivise more gross emission reductions. The paper outlines several options to rebalance the ETS towards more gross reductions.

2. We support New Zealand's net-zero carbon target and sinking budgets to achieve that target. Climate change is a global problem. New Zealand contributes to this problem and has a responsibility to address it. New Zealand's businesses have a crucial role to play in achieving the reductions sought under the Paris Agreement.

3. Change in New Zealand is already well underway, with the government, policymakers, businesses, and individuals taking decisive action to reduce emissions. We would like to acknowledge the remarkable efforts of businesses throughout New Zealand in proactively addressing climate change and striving to become global leaders in sustainability.

4. Significant investments have been made, and numerous changes have been implemented. For instance, the following examples illustrate just a few of the countless projects currently underway within New Zealand's businesses.

    - Methanex has made a significant investment to reduce carbon emissions at its Motunui facility by improving its distillation columns. Emissions at the site will reduce by 50,000 tonnes per annum, the equivalent of taking 20,000 cars off the road.

    - Mercury, Contact Energy, Ngawha Generation, and Eastland Generation have committed to trials of geothermal carbon reinjection and sequestration technology. It may be a common feature of New Zealand's energy network in the future. If successful, carbon reinjection has the potential to reduce emissions from geothermal by 568,000 tonnes per year, equivalent to taking over 236,000 cars off the road.

    - OMV has replaced a gas-turbine driven compressor with an electric-driven compressor (reducing emissions by 3,400 tonnes per annum), replaced a steam-fired water makers with reverse-osmosis units (reducing emissions by 6,000 tonnes per annum), and improved Maui A generator efficiency (reducing emissions by 3,000 tonnes per annum).

    - Contact Energy, with its investment in new renewable energy from geothermal at Tauhara, and Te Huka, Southland wind and the closure of some gas power stations, have reduced their scope 1&2 emissions from 2,213ktCO2e in 2012 to 788ktCO2e in 2023. The company plans to be net zero by 2035.

    - New Zealand Aluminium Smelter (NZAS), one of the lowest carbon intensive smelters globally, has reduced its CO2 emissions by almost half since 1990 through the application of a range of reduction and capture processes.

    - Golden Bay Cement has invested more than $200m since 2004 in decarbonisation projects. Its Whangarei cement plant now substitutes 50% of the coal used to power its cement kiln

[1] More information about BusinessNZ and BEC can be found under appendix one.

with used tyres and construction waste that were once destined for landfills. Emissions from its clinker production are amongst the lowest in the world. The company has a well-developed plan to replace the rest of its coal use with biofuels derived from waste streams.

- Oji Fibre Solutions have invested hundreds of millions of dollars in decarbonisation projects since 2014. The company is investigating a potential $0.5 to $1.6 billion investment on a proposed bio-products hub that would reduce emissions by up to 140,000 tonnes per annum.

- A joint venture between Balance Agri-Nutrients and Hiringa Energy is working to construct four wind turbines to produce green hydrogen to be used to produce low-emission ammonia-urea. The project will reduce the carbon footprint for Balance Agri-Nutrients products and supply electricity to the grid of up to 24,000 homes.

5. The work continues, and New Zealand's businesses remain committed to facing their plans head-on, showcasing their success and competitiveness in a world increasingly prioritising sustainability by actively contributing to the global challenge of reducing emissions.

6. For this momentum to persist, the policy and regulatory environment must foster investment in decarbonisation and align with the efforts to achieve substantial emissions reductions. This includes immigration settings that are open and simple, attracting oversea talent; regulatory regimes that are workable and stable, providing certainty; regulatory intervention with proper scrutiny and debate, providing net benefits and minimising unintended consequences; settings that attract overseas investment, providing the much-needed capital.

7. Policies should communicate clear signals and help eliminate barriers to decarbonisation. The actions and policies of the government must be sensible, evidence-based, and consider all trade-offs while safeguarding our economic growth and living standards.

8. New Zealand's ETS is a significant instrument in our arsenal to help drive decarbonisation decisions. As a potent market tool, it plays a pivotal role in helping the country attain its emissions reduction targets. For the ETS to yield its desired impact, it must be effective, supported by complementary policies that work in synergy to ensure its efficacy.

9. But it must also be allowed to bed-in and do its job, to successfully reduce carbon emissions across industry, energy, and transport. If we want the ETS to remain our key policy tool in achieving New Zealand's net-zero greenhouse gas emissions by 2050, are serious about acting on climate change, and if we comprehend the impacts of climate change, then we cannot afford to debate whether we should focus on reductions, removals, or adaptation. These will all have to work together in harmony.

10. The following submission aims to provide the Ministry with further input, concerns, and other considerations on the proposed ETS review. Overall, the submission balances the broad view of New Zealand's business community. As always, we have encouraged members to provide their submissions on proposed changes outlined in the paper.

Executive summary

11. **Firstly, the ETS review has severely damaged confidence in the carbon market.** One important objective of this review should be for policymakers and the Government to assess and outline options that restore confidence and improve the credibility of the ETS.

12. **We recommend the Government promptly rule out retrospective changes to current NZU rights,** providing more confidence in the stability and predictability of the ETS regime for

businesses and investors. By continuing clear and unambiguous property rights and avoiding continuous alterations, New Zealand can foster a conducive environment for investment. **Any options should be considered as forward-looking**.

13. **We recommend that any changes to the ETS should be guided by key principles: flexibility, stability, cost-effectiveness, simplicity, and optionality.**

14. **Furthermore, we recommend conducting a comprehensive quantitative analysis to determine the level of gross emission reductions intended up to 2050 before any options are decided.** This analysis should guide policy development by providing clarity on the intended gross reductions, which is essential for achieving a balanced approach in the ETS. Outlining targets for gross reductions and afforestation would provide more clarity on the required auction volumes, price corridor, and level of afforestation, enabling a comprehensive economy-wide assessment of the costs and implications associated with pursuing each pathway that deviates from the current pathway.

15. **This should include an assessment of the costs and benefits of each option in rebalancing the ETS towards more gross reductions.** Gathering data on emission reduction elasticities from the market to better understand the price responsiveness of higher emission prices for emission reductions is important. This data will offer valuable insights and contribute to the policy development process.

16. **Alongside the assessment of current options, we recommend assessing non-ETS measures aimed at managing and controlling afforestation,** such as implementing mechanisms and regulatory measures that could address the issue of 'excessive' afforestation and its negative externalities, without changing the current ETS structure and undermining its effective price signal for afforestation and gross reduction. This could include better land-use planning and requirements on forestry management.

17. **We would like to see a comprehensive assessment of all aspects impacting afforestation economics and potential planting.** It should consider factors beyond the carbon price to formulate robust policies and solutions.

18. **This should include undertaking a comprehensive assessment of the potential amount and types of land suitable for afforestation in the permanent exotic forestry category**. This information will be valuable in understanding the extent of the potential problem of 'too much' afforestation.

19. **We recommend to account for constraints beyond the ETS,** such as the speed at which businesses can source and adopt low-carbon technologies and the availability of skilled workers. This includes exploring complementary policies to overcome these constraints and support the transition to low-carbon technologies.

20. **We currently do not support any option at this stage due to the lack of detail and inadequate acknowledgement of non-ETS measures that could address the stated problem.** The options remain broad, simplistic, and not specific. The lack of detail about each option and its implications for New Zealand's business community remains largely unclear. We expect further assessment of each option. Thorough evaluations are necessary to ensure that the chosen approach aligns with the nation's climate goals while also supporting the growth and resilience of New Zealand's business sector. As noted, **we believe further options should be assessed**, which include measures outside the ETS aimed at managing and controlling afforestation that do not weaken the carbon price signal.

Identifying the problem

21. The paper's modelling results, incorporating various exogenous and endogenous input assumptions, including the Climate Change Commission's price path and emissions related to the price, demonstrate that if large quantities of forestry planting shown before the review continues, there will likely be an excess of forestry units compared to the overall NZU demand by the 2030s. While different inputs yield different outcomes, the main finding is that the current ETS settings will likely lead to an 'oversupply' of forestry, resulting in an accumulation of stockpiled units and subsequently weakening the carbon price and the incentive for gross reductions.

22. This modelling-derived conclusion sheds light on the Government's preferred stance to rebalance the NZ ETS, with a specific focus on promoting more substantial gross emission reductions. This preference is reflected in the Government's Emission Reduction Plan (ERP).

23. We recognise that no modelling will ever be completely perfect. It will have inherent limitations, relying on limited information and assumptions, and does not predict future outcomes. Given this, we believe that policymakers should account for supplementary factors alongside the modelling results. This encompasses factors that could potentially impede the envisaged level of afforestation portrayed in the paper's modelling.

24. We note that the land and log prices are fixed. This is sensible from the perspective of modelling. However, in reality, these two variables have a significant impact on the decision-making process for foresters when it comes to planting. It is important to carefully consider the opportunity cost of permanent forestry decisions taken by landowners.

25. Assessing the potential amount of land and the specific types of land that could potentially be afforested and remain in the permanent exotic forestry category would provide a valuable set of information. This might be difficult to undertake, but its clarification would help depict the extent of the possible problem of 'too much' afforestation. As noted, the assumption remains that the price response for afforestation under the period of lower prices will carry through in times of higher emission prices. However, there is considerable uncertainty about whether this will happen.

26. Afforestation decisions made by landowners are not solely influenced by short-term price fluctuations in the secondary market. Instead, they are carefully planned based on price expectations over an extended period, mostly decades ahead. The current model assumes a continuous trend of planting, leading to an oversupply of units and subsequent drop in carbon prices. However, policymakers should also account for the likelihood that forestry participants in reality react to an oversupply by slowing down and reducing planting rates.

27. Foresters' decisions are multifaceted and depend on various factors, including the cost of capital, regulatory risks associated with permanent forestry being in or out of the ETS, and the proximity of planted land to local roads and nearby ports. Additionally, the cost and difficulty of planting and maintaining specific tree species, insurance costs, compliance expenses, rates, pest control, water runoff, and track maintenance all play a significant role in shaping their choices. The land class of potential land also influences decisions, with most foresters choosing to plant on stony, steep, and marginal land with limited land-use options, which tends to have lower value compared to more productive land.

28. A comprehensive ETS review must thoroughly assess all these aspects that impact the economics of planting and, consequently, the probabilities of potentially new afforestation registered within the ETS. This approach would add nuance to the review process, going beyond just considering the carbon price. Understanding these complexities will enable a more robust evaluation and policy formulation that adequately addresses the challenges and opportunities associated with afforestation in the ETS.

29. We recognise that the model does not account for uncertainty, as it relies on historical data and intentions for rational decision-making. However, policymakers must seriously consider the uncertainty in the market and the likelihood of the endogenous supply figure within the modelling coming to fruition. The trust in the tool has been compromised, and the future of forestry in the ETS is fraught with uncertainty. The situation is further exacerbated by risks to current permanent forestry property rights.

30. New Zealand will need additional permanent exotic afforestation to fulfil its Nationally Determined Contribution (NDC) targets. The paper and the Climate Change Commission both emphasise the crucial role of afforestation in achieving these goals. To realise this vision, it is imperative to maintain strong incentives for ongoing afforestation efforts.

31. The key question is how we can ensure the desired level of afforestation and how the ETS review can steer New Zealand back on track, encouraging foresters to resume planting activities. This requires establishing foundational principles in considering potential options for the way forward.

Fundamental principles

32. By setting these principles, we can chart a course that ensures sustainable and consistent afforestation, paving the way for New Zealand to meet its climate targets. The principles below are not ranked by order of importance.

Balances all options

33. We are pleased the document acknowledges the need for both removals, gross reductions, and adaptation. We agree strongly. Meeting net zero requires all options, not one or the other. They must work in harmony. This approach is reflected in meeting net-zero the international commitments made by 194 states, including New Zealand's own commitment under the Climate Change Response Act 2002 (CCRA).

34. The ETS should maintain a regime that incentivises removals and gross reductions. The ETS currently achieves this by determining abatement costs through supply and demand dynamics with decreasing capped units over time, encouraging the market to discover cost-effective options at corresponding price levels.

Allows for cost-effective solutions

35. Another principle should ensure that the ETS is effective in helping to achieve our net-zero commitments in a cost-effective manner, a current capability of the ETS. It is essential not to dismiss the pursuit of the lowest-cost combination. While this may seem obvious, it carries paramount significance. We must emphasise that opting for the lowest-cost options does not equate to compromising on quality.

36. With scarce time, private and human capital, natural resources, and tax revenue, we face choices. While we might prioritise more gross reductions over a combination of gross reductions and sequestration efforts, such decisions incur costs by diverting resources from other urgent societal issues. Identifying the most cost-effective options for achieving net-zero ensures maximum carbon emissions reductions for the value of our investments, benefiting businesses and the country. Climate change policy is about being effective and not expensive. If the costs are too high, and the public turn against those policies because of the cost, then meaningful change will be hard to come by.

Protects flexibility

37. Another guiding principle should be the importance of flexibility in meeting surrender obligations within the ETS. As it currently operates, the ETS grants emitters the freedom to choose the most

cost-effective strategies for fulfilling their surrender obligations, whether through unit purchases or investment in emission reduction projects. The market mechanism ensures that emission reductions occur in the most economically viable areas, prompting emitters to prioritise cost-effective abatements initially. As prices rise or more commercially viable technologies emerge, they can gradually adopt alternative solutions with lower capital and operating costs. Preserving this flexibility allows for a combination of removals and reductions, safeguarding against costly approaches in achieving net zero while ensuring a range of options are available.

Is simple, not complex

38. The ETS should limit complexity and maximise simplicity. Introducing additional layers of complexity with additional restrictions and mechanisms within the tool increases the risks of distorting the carbon price, complicating the signal and inevitably the decision-making undertaken by firms.

39. It is essential to recognise that the ETS serves as a specific tool rather than a comprehensive strategy. Attempting to address all externalities solely through the ETS could be risky and counterproductive. Instead, addressing and mitigating these externalities may require the use of complementary policies that work alongside the ETS. These policies can complement the tool by addressing specific challenges that cannot be adequately tackled within the ETS framework.

40. For instance, overcoming infrastructure lock-in barriers, coordination failures, chicken-and-egg problems, and addressing non-financial obstacles like labour and resource constraints may necessitate additional policy measures beyond the scope of the ETS. By using a combination of tools and complementary policies, we can effectively address various challenges and achieve meaningful emission reductions while maximising the effectiveness of the ETS in its primary role as a market mechanism.

41. Complementary policies extend to addressing forestry risks, which undoubtedly face various challenges like forest fires and diseases. Recent extreme weather events, such as Cyclone Gaberille, have highlighted that forestry investments are not a risk-free. Policies outside of the ETS, that are reasonable and workable, aimed at ensuring well-managed and resilient forests in the face of extreme weather would be beneficial.

Stable over time

42. Another vital principle for the ETS should be to maintain the scheme's stability and the trajectory of settings over time. The framework should exhibit consistency, with the cap gradually reducing in a stable manner. This stability is crucial to provide participants with clear foresight of settings into the future, enabling them to nurture long-term investments confidently. The stability of the ETS framework must endure across political shifts, enjoying robust cross-party support. By doing so, the tool can restore and bolster market confidence, which is an indispensable prerequisite for effectively decarbonising New Zealand's businesses and achieving our targets.

Restoring market confidence

43. After the announcement of the NZ ETS review, the secondary price of NZUs experienced a sharp decline and remained at a low of $36.50 by early July. Since then, market participants have been grappling with significant uncertainty about the future composition of this important tool.

44. The Government's unexpected decision to reverse course and adopt the Commission's advice on unit settings and price controls has provided a boost to NZU prices. But it is essential to recognise that these higher prices, due to tighter settings, do not indicate a resurgence of confidence. On the contrary, market confidence remains shaky, and participants express their apprehension and doubt regarding the future of this tool and how it will inevitably operate.

45. It is not surprising that the market's reaction to the review results in uncertainty about the tool's future. A review that presents several potential options, each with varying functions and mechanisms that are yet to be fully conceptualised, introduces a large element of the unknown.

46. Any concrete decision is highly unlikely to be made until after the general election. The process of fully conceptualising and selecting a specific option is equally hard to predict. If structural changes are deemed necessary, they will require a significant amount of time to be integrated and implemented. This timeframe will depend on the specific option. The Government should carefully consider the time-consuming nature of reform in the assessment of all proposed options.

47. In the interim, as the options are still being conceptualised and remain high-level, it is essential to address the short-term uncertainty prevailing in the market due to the review. The options discussed in the paper include potential restrictions on forestry units and the possible establishment of two separate markets for gross reductions and removals. The paper does not rule out the possibility of retrospective changes to the rights of permanent forestry currently registered in the NZ ETS. This is a **matter of deep concern** with significant implications.

48. Minister Shaw rightly acknowledges the potential consequences arising from retrospective changes. **We firmly believe that the Government must promptly rule out any retrospective changes to provide stability to carbon markets. Any change should be forward-looking.** Delaying the decision will only amplify the negative impact on New Zealand's reputation as an attractive destination for investments in decarbonisation and needed removals.

49. Reforming the ETS structure frequently, disincentivises efforts to decarbonise, at least throughout the period of change, with participants incentivised to wait until more information arises. This must be taken seriously, as the time to achieve New Zealand's targets remains constrained. As the timeframe extends, the level of uncertainty persists, and the impact on foresters and businesses with surrender obligations trying to reduce their emissions becomes more pronounced. The Climate Change Commission highlighted the risks of uncertainty resulting from reforming the regime and the importance of resolving the changes appropriately. This has not been heeded.

    "Ideally, this process would proceed in a timely manner, to avoid prolonged uncertainty about how the NZ ETS will operate. This would risk the perverse outcoming of discouraging investment in the forests that are needed."[2]

50. In a world where inherent uncertainty exists, it is both unreasonable and impossible to offer complete assurance. However, the Government can play a crucial role in reducing uncertainty by establishing relatively stable regulatory regimes. Such regimes instil confidence in businesses and investors that policies will remain consistent and durable over time. Having a stable regulatory backdrop allows businesses to plan and make long-term decisions regarding their investments and the adoption of emission reduction solutions at the right time and price for them.

51. Implementing emission reduction projects and plans, especially for large organisations, is a complex process involving engineering, financing, implementation, and operational considerations. It requires exploring options from overseas and integrating them into New Zealand's context, conducting research, and developing new technologies to ensure their technical and economic feasibility. All these endeavours demand considerable time and resources, and businesses need the confidence that their investments will yield returns. A stable regulatory regime helps safeguard their investments.

[2] *Inaia tonu nei: He Pou a Rangi, a low emissions future for Aotearoa,* The Climate Change Commission (2021)

52. Conversely, when the regulatory landscape is constantly changing and lacks consistency, decision-making becomes difficult. Firms become apprehensive about unexpected risks and liabilities, and hesitate to invest significant capital in emission reduction efforts.

53. In many cases, parent companies operating overseas prefer to invest in countries with favourable policy environments that promote decarbonisation and provide regulatory certainty and long-term stability that underpin this promotion. This was a clear conclusion from our recent research conducted in May 2023. This involved interviews with leaders from across New Zealand's emissions-intensive-trade-exposed (EITE) businesses.[3] They all noted the significant implications upon their businesses resulting from ETS policy uncertainty:

    "When it comes to capital investment, that has been a bit shy over the last 10 years, and it's mainly down to policy uncertainty."

    "We can't make long-term investment decisions because of frequent changes to the ETS. It can absolutely destroy a business case, and we don't know what it will look like."

    "We could be in a situation where something new gets implemented, the ETS gets reset, and we lose the value of what we have implemented."

    "Fiddling with the ETS rules could make our payback of a project look worse. How can we plan long-term when the ETS is so uncertain?"

54. **We <u>recommend</u> one of the primary objectives of the ETS review, and the analysed options, should be to provide certainty regarding future ETS policy,** including the roles of gross reductions, removals, and industrial allocation policy. The International Monetary Fund has recently highlighted the need for climate policy certainty in New Zealand and has called for a 'reduction in policy uncertainty.'[4]

55. The review should be conducted meticulously and accurately, thoughtfully considering the trade-offs and consequences. The chosen option should be allowed to settle without further and continuous changes. Continuously making alterations and adjustments in a state of uncertainty is not conducive to effective decision-making.

56. The constant amendments to the ETS over the past three years have had unintended consequences. The tool's credibility has been damaged, and its future is questionable. To regain confidence, it is essential to establish a clear and consistent long-term trajectory of ETS settings. This will create a stable and attractive environment for investments in decarbonisation efforts, ultimately helping New Zealand achieve its net-zero target.

57. The uncertainty surrounding whether forestry units held by obligated parties will be able to meet future obligations raises questions about their current and future value under any new regulatory framework. It also raises concerns about how many of these units obligated parties will be able to use to fulfil their future obligations and whether any time limits on their use will be imposed. This uncertainty puts into question units worth hundreds of millions of dollars.

58. Making changes to **existing** forestry unit rights without adequately considering the grandparenting of current NZU-F into the new regime would severely erode confidence in the regime, thus hindering medium to long-term decarbonization efforts. Businesses have invested, and will likely continue to invest billions collectively to comply with their surrender obligations as mandated by law.

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[3] Future of Work Tripartite Forum Research, *Insights into emissions-intensive, trade-exposed businesses,* May 2023

[4] https://www.energynews.co.nz/news/carbon-credits/140735/reduce-carbon-policy-uncertainty-imf

Diminishing the existing rights of these units would damage New Zealand's international credibility as a country to invest.

59. This damage extends to landowners as well. The lack of clarity regarding retrospective changes has already caused disruptions to forestry planting activities. Those who own suitable land for conversion to forestry, which is essential to achieve our net-zero targets, would understandably question the security of their potential investment.

60. In a market economy, clear and unambiguous property rights are a fundamental cornerstone. These rights must legally be enforceable, and any reduction or removal of property rights through regulatory actions should generally warrant compensation. Without adequate protection against confiscation by the state or other entities, the motivation for individuals and businesses to invest and develop productive assets is significantly diminished. Under the scenario where current rights are not grandparented, foresters operating under the newly reformed regime would understandably question the investment in new planting, as they have no definitive assurance that the investment in developing their asset is protected against unduly takings from further regulatory changes in the future.

61. If retrospective changes were to result in regulatory takings, it would likely lead to prolonged and expensive legal battles, hindering New Zealand's decarbonisation efforts. Such an outcome is unfavourable, as it obstructs our progress towards addressing climate change. **We strongly reiterate that stability and certainty in property rights are essential in maintaining the momentum of our decarbonisation progress.**

Options proposed in the consultation

62. Expressing preferences and commenting on the options presented in the paper is challenging due to its high-level nature. The options lack detailed quantitative assessments, making it imprudent to support any option without a comprehensive analysis of the trade-offs involved. The options presented remain broad and simplistic, and do not encompass regulatory measures beyond the ETS that could constrain afforestation externalities (i.e., oversupply of afforestation, fire, and disease risk), without damaging the market signal for afforestation and gross reduction by changing the market itself (i.e., separate markets for forestry units and auctioned NZUs).

63. While we understand that the modelling and comprehensive assessment of various options' impact on unit supply, demand, and price, as well as the role of forestry and gross reductions, will be conducted after the ETS review feedback stage when the options have been specified in more detail, we believe that such an assessment should have occurred before the consultation was released.

64. The lack of specific details for each option, combined with the uncertainty surrounding the potential for retrospective changes and the need for clarity that any changes will be forward-looking, has contributed to the current market uncertainty mentioned earlier. Restoring complete trust and confidence in the ETS may be challenging, as evidenced by the current rhetoric from ETS participants. Resolving these issues is essential to ensure the effectiveness of our climate policy.

65. To conduct a comprehensive assessment of the costs and benefits associated with potential changes to the ETS and explore different options, it is crucial to ensure that any alterations implemented do not inadvertently lead to worse overall outcomes, failing to achieve the intended benefits envisaged by the Commission and the Government.

66. The paper highlights that other countries are increasingly prioritising gross emission reductions, and not following suit could damage New Zealand's reputation and access to markets, as financial institutions demand specific climate standards for the country's products and services. This is a

legitimate concern, as New Zealand may be viewed less favourably compared to its competitors if it doesn't rebalance the scales towards more gross emission reductions. However, as discussed on the first page, significant investments have been made by businesses to reduce gross emissions across New Zealand.

67. It is also equally important to consider other significant factors, such as the costs of adopting a change in strategy that emphasizes more gross reductions compared to the approach of the current settings, from an economy-wide perspective and its impacts on households.

68. Constraints outside the ETS also play a crucial role. While the ETS effectively signals the cost of carbon, in many cases, businesses may not be able to respond immediately to higher carbon prices due to various limitations. The speed at which businesses can adopt and operate new low-carbon technology and equipment must be taken into account, along with the availability of skilled workers to install and maintain these technologies.

69. Last year, DETA Consulting identified about 1,100 fossil fuel-powered boilers dispersed across 400 organisations and businesses, producing 24PJs of heat, the equivalent of 65% of the South Island's electricity consumption.[5] Replacing these boilers with low-carbon alternatives, such as heat pumps, provides meaningful emission reductions.

70. But despite a strong ETS signal and the best efforts of businesses sourcing alternative boiler technology, supplies remain limited and in many cases investments are capital intensive. Even if they can source available supplies and capital, these businesses also face a tight labour market and a shortage of workers with the required expertise to install and maintain new heat pumps and biomass-powered boilers.

71. Complimentary policies, outside this document and the Ministry's scope, will help address these constraints. For example, New Zealand will need to attract international expertise. To achieve this, the country needs open, simple, responsible, and permissible immigration settings.

72. Considering other aspects of this assessment, there are risks for New Zealand's hard-to-abate businesses and sectors that currently have limited options to switch to alternative technologies, especially if they are unviable or not readily available. Evaluating the risks of higher emission prices for such industries, as well as potential carbon leakage and supply-chain impacts, is crucial, particularly if emissions-intensive-trade-exposed (EITE) firms decide to leave the country.

73. During the Ministry's assessment of the outlined options, **we strongly recommend incorporating a quantitative analysis to determine the desired level of gross emission reductions up to 2050**. This analysis would provide valuable guidance for the policy development of any option(s), and further options not yet identified in this paper, including the status quo.

74. If the core issue is the inadequacy of gross reductions under the current settings over the coming decades, as emphasised throughout this document, it is essential to specify the required number and target of gross reductions. This approach of outlining the intended gross reductions and afforestation targets would facilitate the policy development process for each potential option and allow for a comprehensive economy-wide assessment of the costs and implications associated with pursuing each pathway. Comparing the economically rational pathway with the costs of not meeting New Zealand's NDC is of utmost importance.

75. As mentioned earlier, **we do not support any proposed options at this stage due to the current lack of information and detail. Nevertheless, there are a few considerations**

[5] New Zealand's Process Heat Fuel Future, DETA Consulting, 2022

that policymakers should consider, which do not appear to have been addressed in the paper:

76. Option 1 mentions the possible review and amendment to industrial allocation policy. We strongly question the need and validity of this review. The Ministry for the Environment has already completed its assessment and the Government's proposed amendments resulting from this assessment are currently before Parliament. BEC has submitted to enhance the Bill's provisions and incentivise decarbonisation projects. The Bill's current state contains multiple barriers unintentionally weakening decarbonisation efforts. Further review and assessment to industrial allocation policy appear unnecessary.

77. We express that Option 2 raises concerns about the market's ability to meet surrender obligations due to limited liquidity. The availability of units is currently tight, and liquidity is constrained. Intensifying this tightness by further tightening units and allowing international buyers to purchase NZUs will significantly complicate the task of achieving New Zealand's NDC. This poses a substantial risk to the Government, as it may have to resort to purchasing international credits to meet the 2030 NDC, potentially exacerbating New Zealand's already ballooning balance of payment deficit.

78. Option 3 lacks consideration for existing NZUs rights, which would significantly undermine the value of current offtake contracts. This could lead to legal disputes and litigation, causing a severe blow to the confidence in the tool's effectiveness going forward. Moreover, implementing this option would introduce complexity into the scheme and open doors for further changes to restrictions.

79. Option 4 outlines the risks of additional complexity and possible cost for achieving net zero. It enhances the Government's ability to set carbon prices, thereby introducing further risk of policymakers establishing a price range that is excessively elevated and done in a hastily manner, consequently engendering disruptive economic and social impacts. But again, the release of additional quantitative assessments will provide a clearer picture.

80. We observe that the options presented in the paper primarily focus on amending and reforming the market's structure, with limited consideration of alternative non-ETS measures and mechanisms that could better manage and control afforestation. Addressing the issue of excessive afforestation and its secondary impacts could be accomplished through supplementary regulatory measures. This could include changes to forestry management practices or improved land-use planning through the National Environmental Standards for Plantation Forestry (NES-PF), and mechanisms to reduce the risks associated with fires and disease on surrender obligated parties.

81. **Therefore, we strongly recommend that potential regulatory and non-ETS options aimed at addressing the stated problem of 'excessive afforestation' be thoroughly examined and evaluated alongside the existing proposals presented in the paper. This may highlight a more effective approach that does not undermine the scheme's current ability to send clear price signals.**

Appendix 1: Comments on the paper's modelling

82. Running the model with the exogenous input from the CCC demonstration price path of $260 (2019 prices) to 2050, combined with the central estimate from the afforestation intention survey, highlights the uncertainty about the price responsiveness of higher emission prices on emission reductions. The extent of this response remains uncertain. We acknowledge that the availability of data to construct a price response model is limited, and the Ministry has consequently reproduced the Commission's modelling results well. However, the absence of price elasticity response data gathered from the market emphasises the importance of collecting such data, as it could offer valuable insights. We are aware that the Ministry is currently gathering information on emission

reduction elasticities, which will play a significant role in providing a clearer understanding during the policy development process.

83. The modelling relies on the central estimate derived from the afforestation intention survey conducted by the Ministry of Primary Industries (MPI) in 2023, with these figures being projected into the future. It is worth noting that historically, these surveys have been reasonably accurate in predicting actual planting for the corresponding year. It is also worth noting that this information is highly likely to have changed, particularly considering recent developments.

84. As mentioned earlier in this submission, foresters are currently grappling with substantial uncertainty due to the ongoing review and the political rhetoric surrounding gross or net reductions. This uncertainty has resulted in a halt in planting activities. Extrapolating the intention data from 2021 poses challenges as it assumes certain factors such as land values, alternative land-use options, and foresters' constraints. It is important to understand that the model cannot predict future intentions, and policymakers naturally lack options. Assessing current intentions and likely intentions over the next few years is important, as they will significantly impact the magnitude of the issue and the corresponding potential solutions.

85. The potential annual level of afforestation, derived from the Manley analysis, indicates a considerable range of afforestation between 60,000 and 120,000 hectares per year. This level of afforestation is notably higher than recent pre-ETS review levels. The analysis suggests that as the sector receives more investment due to increased demand, there will be a corresponding increase in nurseries and labour flow. Again, we note that policymakers will likely need to account for recent and current market uncertainty impacting the intention of future investment.

Appendix One - Background information on BusinessNZ and BEC

BusinessNZ is New Zealand's largest business advocacy body, representing:

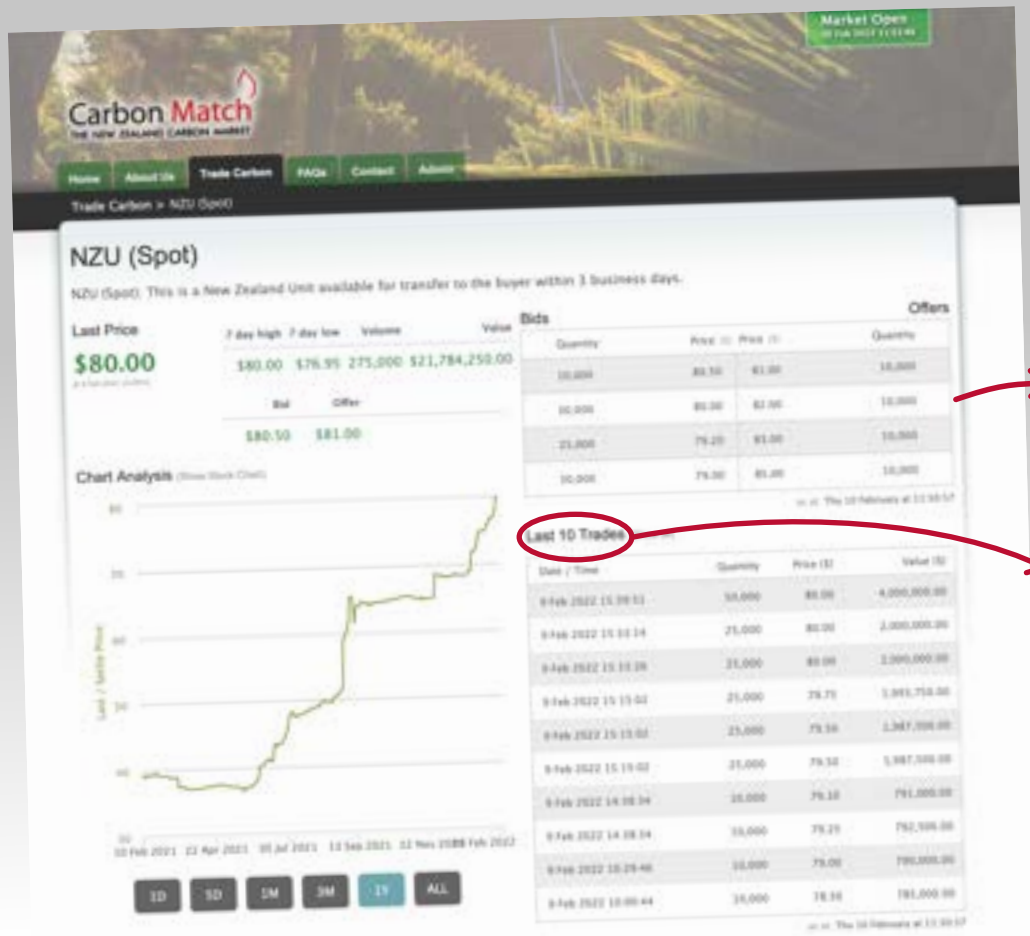
- Regional business groups EMA, Business Central, Canterbury Employers' Chamber of Commerce, and Employers Otago Southland
- Major Companies Group of New Zealand's largest businesses
- Gold Group of medium sized businesses
- Affiliated Industries Group of national industry associations
- ExportNZ representing New Zealand exporting enterprises
- ManufacturingNZ representing New Zealand manufacturing enterprises
- Sustainable Business Council of enterprises leading sustainable business practice
- BusinessNZ Energy Council of enterprises leading sustainable energy production and use
- Buy NZ Made representing producers, retailers and consumers of New Zealand-made goods

BusinessNZ is able to tap into the views of over 76,000 employers and businesses, ranging from the smallest to the largest and reflecting the make-up of the New Zealand economy.

In addition to advocacy and services for enterprise, BusinessNZ contributes to Government, tripartite working parties and international bodies including the International Labour Organisation (ILO), the International Organisation of Employers (IOE) and the Business and Industry Advisory Council (BIAC) to the Organisation for Economic Cooperation and Development (OECD).

The BusinessNZ Energy Council (BEC) is a group of New Zealand's peak energy sector organisations taking a leading role in creating a sustainable energy future. BEC is a division of BusinessNZ, New Zealand's largest business advocacy group. BEC is a member of the World Energy Council (WEC). BEC members are a cross-section of leading energy sector businesses, government and research organisations. Together with its members BEC is shaping the energy agenda for New Zealand.

Our vision is to support New Zealand's economic wellbeing through the active promotion of the sustainable development and use of energy, domestically and globally. With that goal in mind, BEC is shaping the debate through leadership, influence and advocacy.



See The Market, Be Part Of It!

Don't just take a price over the phone. See market depth for yourself.

Real Prices, Real Time

Know where it's at! Volumes and prices of the last 10 trades can be seen by all Carbon Match users (identities withheld).

Who can use it?

Carbon Match is a multi-lateral wholesale trading platform intended for repeat traders of large parcels of NZUs, normally 10,000 units or greater.

If your business is the recipient of an industrial allocation and expecting to be a repeat seller on an annual basis, please get in touch as we can also help you with your smaller parcels.

Who is Carbon Match?

Founder Lizzie Chambers has worked in finance and environmental markets for over two decades both in New Zealand and overseas. She is a chartered member of the NZ Institute of Directors, a former Director at the Crown Research Institute Scion and a judge in the Energy Excellence Awards.

Carbon Match
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Ministry for Environment

Willis Street, Wellington 6011

11 August 2023

Re: ETS Review

Please accept this letter as our short response to the ETS Review consultation document.

Introduction

Carbon Match Limited operates a secondary market place for the trading of spot (i.e. immediately available) New Zealand Units ("NZUs"). We have been in business since 2011. Our clients include major energy companies, local fuel resellers, global oil majors, international banks, forestry companies and their consultants and managers, and other institutions.

Carbon Match is a secure online platform that enables buyers to bid for, and sellers to offer to sell, New Zealand Units. Contracts struck are legally binding but direct between parties - i.e. unlike other models, Carbon Match handles neither the units nor the funds, meaning that all pricing is set based upon the competitive and transparent interactions of buyers and sellers. Please see our website for market rules and terms of use.

Carbon Match revenue comes from a fixed trade fee per unit bought and sold, rather than a % based commission. Our fees are invoiced explicitly to participants rather than deducted on the way through, making us not just an extremely low cost option for trading but also a trusted one.

Trade prices and volumes on the Carbon Match online spot contract are automatically disclosed and all buyers and sellers using Carbon Match can see 1) market depth (i.e. other bids and offers); and 2) a price history chart and the volumes and prices of the last ten trades. Bids and offers are made anonymously and the identities of those who have traded are withheld, except of course from the other counter-party to a sales contract. The attached marketing flyer shows the main Carbon Match trading screen as seen by logged-in traders.

In addition to providing this service, we also sell data based on our traded prices and volumes, and send out a variety of free newsletters, generally on a weekly basis.

Lizzie Chambers, founder of Carbon Match, has been involved with carbon and environmental markets since 2005, has a Masters in Utilities Regulation from the London School of Economics and also a first class Honours degree in Finance from Victoria University of Wellington. She has been involved with the New Zealand Emissions Trading Scheme since its inception and follows related regulatory developments closely.

Critical Concern

The market response to the release of this consultation document was dramatic, with NZUs falling rapidly into the mid to late $30s. As evidenced clearly by the behaviour of traders, and the sharp decline of NZU prices that we have witnessed on the Carbon Match Trading platform and indeed across the NZU trading community, this document has raised critical risk for those investing in emissions removals *and* reductions, and in turn Aotearoa's ongoing progress towards decarbonisation.

We are concerned that some of the options raised, indeed apparently favoured in the document, will continue to deter investment and create bad faith among landowners to the extent that new sources of sequestration are starved of investment, planting slows markedly, and Aotearoa's broader decarbonisation aims are put at risk.

Background

As a country, New Zealand has signed up to a target that is expressed with reference to ***net*** emissions reductions - specifically 50 per cent reduction of net emissions below our gross 2005 level by 2030 (covering the period 2021-2030.) We also have a target to reduce emissions to net zero by 2050.

The expression of our international target in this way (rather than with reference to gross emissions reductions) means that the Crown benefits from the flexibility afforded by this target in terms of changes in land use and sequestration. To date, the design of the ETS has mirrored that, conveying that flexibility to the private sector.

The original design of the ETS sought to devolve a target in net terms down to the sectors covered by the ETS. The idea was that over time the ETS would cover all sectors and all greenhouse gases covered by our international targets. Such an approach was thought to be equitable because our country's transition will be funded by both the taxpayer and the private sector. Like the Government, many businesses in the private sector have exposure to both assets that produce real emissions, and land that can be deployed to sequester some of that. Hence, to date, the ETS has not sought to distinguish between gross and net reductions.

(Gross reductions can of course be targeted and accelerated by many other complementary policies for example, via public-private partnerships - for example, the recent NZ Steel and Fonterra emissions reductions co-investments; and via subsidies and incentives - for example, the Clean Car Discount.) Conversely there are a number of regulatory tools or levers outside the ETS that could in theory be deployed to reduce availability of ETS eligible land, or to incentivise investment in permanent forestry outside, or alongside, the ETS.

We are now 15 years into the ETS and no progress has been made on the inclusion of agriculture's biogenic emissions though of course the sector faces a price in respect of its fossil-fuel related emissions. At an international level we have signed up to an economy wide reductions target which, without a pivot away from our primary productive sectors, implies a growing need for sequestration of all types. Incentivising land-use towards maximum sequestration while maintaining productive capacity is critical. As will be almost entirely removing fossil fuel use, while maintaining the necessary energy security.

The carbon market that has developed around the current ETS is now 15 years old. Businesses hold units on a spot basis, have committed to forward purchases, long term off-take contracts, bought and sold options, and come to pass-through arrangements within their own supply chain and customer base.

The result is many thousands of existing commercial arrangements simply referencing and/or requiring delivery of eligible "NZUs" throughout the future. The current consultation appears to lean towards proposals which would require the legal redrawing of most if not all of these arrangements. It is unclear whether or not this would even be workable, but it would certainly be an onerous and high transaction cost exercise.

The market already appears to have reflected this. Upon release of the consultation on 19 June, NZUs came off sharply, falling from $60 to below $38 within a three week period. (Subsequent reprieve and rebound followed the announcement that Cabinet had decided to adopt the ETS settings in accord with the original Climate Change Commission advice, with a rebound to the $65 mark, however these gains have not sustained.) Underlying volatility driven by increased regulatory uncertainty about unit eligibility as a direct result of this review means that we continue to see very light and some days even no trading on the Carbon Match NZU spot contract.

Activity has turned instead to swap contracts and undisclosed bilateral arrangements. Spot liquidity on screen is at an all time low. Buyers are confused about their ability to use the NZUs they purchase today against future surrender obligations. The result initially was almost a complete drying up of buy-side interest shown on screens, as procurement buyers turned to seeking out NZUs **not** of forestry origin.

For land owners with an interest in carbon sequestration, the announcement of the ETS review was a significant blow. It followed a number of other challenging policy developments/uncertainties. These included the announcement of significant new fees for participation in the ETS, a moratorium on new planting proposed by the National party, changes to the Overseas Investment rules relating to forestry, the intention to require regional council consenting of new forests, the Ministerial inquiry into land use and other reforms affecting landowners, for example freshwater reforms.

With the spot NZU contract losing almost 40% of its value following the Review announcement (and prior to the announcement of the Lawyers for Climate Change action), planting programmes are being paused, seedling orders cancelled, and commercial interest in purchases of land suitable for forestry have all but stopped.

The implication of this consultation, and its portrayal in the media, is that we do not need more forestry, and that exotic forestry should stop. We are approaching very dangerous territory. There is expected to be a “gap” in relation to our Paris achievements of more than 100 million tonnes. Moreover, in the long term, in order to achieve and sustain net zero emissions of CO2e, we need permanent forests that continue to sequester over the long term.

The consultation document itself appears to be predicated on a number of critical assumptions. Some of these need to be updated, others grounded in evidence, or at the very least re-evaluated against the current context.

Specifically:

1. that gross emissions reductions are being crowded out by the availability of NZUs from forestry;

2. that “more money is being invested into exotic forestry than improvements in efficiency as NZUs generated from forests are cheaper than the cost of transitioning to low-emissions alternatives”;

3. that there are too many NZUs from forestry and that the stockpile would continue to grow even in a declining price environment;

4. that over-reliance on forestry will follow unless the ETS is amended, i.e. that there exists no real world constraints or additional regulatory barriers that would limit the ability of emitters to rely on afforestation;

5. that it is the Government’s job to prevent the ETS carbon price from declining to zero in order to protect land values.

The proposals to “improve” the ETS in this document, particularly option 3 and 4, demonstrate an apparent lack of comprehension of - or worse, even a disregard for - well established but complex and sophisticated contractual commercial arrangements already in place. It appears that the decision has already been made that the ETS should be a more precise tool used to directly target ”real” / gross emissions reductions”.

The contention is that the ETS to date has not, and will not work to deliver any significant real gross emission reductions alongside sequestration.

However, given previous regulatory delays and failures to recognise the effect of Kyoto units and a lack of supporting architecture almost a decade ago, it was only in the last two years that prices began to rise to become more meaningful. This follows the institutional reforms designed to give greater credibility and integrity to our international commitments relative to NZ’s marginal abatement opportunities on the ground (outside forestry).

Now, businesses are potentially being asked to accept that they can only buy some concept of a "gross reduction" and not units from forestry sequestration. Foresters are being asked to accept a scenario where they might well find they only have a single buyer for their sequestration units - namely the Government.

In our opinion, there should be symmetry in important relationships and partnerships. To that end, the investor community that we expect will fund gross emissions reductions, should benefit from the same flexibility offered by our net emissions Paris target as the Crown enjoys.

Very few of us want to rent forever if we can plan to own our home. And those managing emissions-intensive assets surely feel the same way. But having some flexibility over timing does matter.

Gross reductions will come in response to price and if there are wrong trees going into the wrong place the ETS is not where that needs to be fixed.

Kind regards,

Elizabeth Chambers

Carbon Match - Responses to Short form Questions

What is the current NZ ETS going to do to emissions reductions and removals?

The ETS has contributed to significant afforestation in recent years, although we note that unprecedented registrations were probably driven by a coincidence of the sunset of the stock change approach, (averaging accounting has no appeal to older forests that have already achieved long term average carbon stock); and the end of a Mandatory Emissions Return Period. Extremely low cost financing up until early 2022 will also have played a part. These conditions have not endured, and while there is always a lag between changes in the operating environment and planting plans, the discussions and anecdotes we hear lead us very much to expect planting in the 2024 and 2025 years to drop off markedly.

With respect to gross emission reductions, we note that as per the consultation document, very little abatement opportunity was expected to manifest below a price level of less than $80. The ETS carbon price (the spot NZU price) reached these levels late 2022, but only for a brief period of time. Then, in December 2022, following Cabinet's unexpected response to CCC advice on ETS Settings, prices fell away sharply.

Given that the required price level did not sustain, we should not be surprised that we have not yet seen significant evidence of gross emissions reductions. However, the more pertinent question in relation to this consultation is "Where is the evidence that gross emissions reductions will **not** occur in response to an ETS that can deliver the requisite price levels?"

Now that the Lawyers for Climate Action have succeeded in their action and Cabinet has seen sense to adopt settings that are in lock-step with the original CCC Settings advice, there is a strong prospect that prices will improve as we move into the 2024 year. Essentially the regulatory uncertainty created by poor decision making in November 28 has set us back perhaps 12-18 months. But the assertion that gross emissions reduction have - or will - be crowded out by cheaper afforestation options - appears to be backed by **ideology rather than evidence.**

Does the NZ ETS need to be able to drive emissions reductions in transport, energy and waste?

It is well understood that the price elasticity of demand for transport fuel to the carbon price is low. Additional complementary measures (such as EV rebates, co-investment in charging infrastructure, etc) may well prove necessary. To date, the ETS has not sought to distinguish between gross and net reductions.

Gross reductions can of course be targeted/accelerated by many other complementary policies for example, via public-private partnerships, co-investments such as the recent NZ Steel and Fonterra emissions reductions announcements; and via subsidies and incentives - for example, the Clean Car Discount.

The GIDI fund and GIF continue to provide significant investment and support for decarbonisation to NZ industry, which will in turn assist in lowering the level of required international abatement in the future. Likewise, the latest announcements of BlackRock's climate infrastructure investment fund and fast-tracking of consents for renewable energy also provide examples of solutions outside of the ETS that are focused on gross emissions reductions.

In addition, given that the majority of landfills are council-owned, we continue to observe fine-tuning of local government policies under the wider framework of national environmental strategies (such as the waste minimisation, resource recovery, disposal, food scraps collection and general methane reduction work-streams already established by ministries).

Does the NZ ETS need to be able to drive emissions removals from activities like forestry?

It is absolutely critical that incentives like the ETS continue to drive afforestation and hence drawdown from the atmosphere of CO2e. Even if this leads to an overachievement in the "ETS bucket", as a country we remain 100-150 million tonnes short of our Paris 2030 commitment. And as we move through time we continue to need further afforestation.

If history proves to leave us in a position where we make no progress on inclusion in agriculture in the ETS, we nonetheless have 2050 net zero ambitions and indeed the science is telling us we need to go net negative. Sequestration of all types can contribute to that, but forestry must obviously remain the critical pillar. Signalling the Government's support for the importance of investment into forestry is imperative, as we have previously seen (for example across 2012-2016) how quickly regulatory uncertainty creates detrimental and devastating effects on iwi, land-owners and those working in the forestry sector.

If the real concern underlying this consultation is that 1) we only have half the economy in the ETS and 2) that half of the economy *does* significantly decarbonise and moreover at a speed which means that ETS supply outpaces demand, then we suggest focusing on establishing a new NDC sequestration mechanism, and a way of paying for or funding this outside the ETS. Given that New Zealand looks set to undershoot its commitment at an international level, concern about the "ETS bucket" overflowing with units appears to be misplaced. A bridge between the "ETS bucket" and the "Non ETS bucket" can be established at any time, subject to agreement on who pays for this. For example, by the New Zealand government becoming a purchaser of NZUs.

If emissions reductions are to be prioritised in the NZ ETS, how could the scheme be changed to achieve this?

We support the use of funding sources like the GIDI, and indeed tax policy, to drive gross emissions reductions wherever can be justified, and as fast as possible. However, we simply do not think that wholesale amendments to the current ETS, whose future commercial arrangements extend for decades, is the way to do this.

Moreover, anything that disincentivizes ongoing planting and sequestration is to our *direct* detriment as a country.

The real issue here is that forestry has become politically contentious thanks to the earlier Labour policy of 1 billion trees. Appropriate regulatory controls, for example spatial planning, consenting, can be used to ensure that we do not end up with prime pastoral land being planted with exotic monocultures in the name of carbon. There is absolutely NO ground to address this issue within the ETS, and the inside workings of the ETS is not the place to fix the issue of "wrong tree, wrong place". There are other regulatory tools at the disposal of policy-makers to deal with this.

Red Stag Group Submission on:

‘2023 Draft advice to inform the strategic direction of the Government’s second emissions reduction plan April 2023’

A submissions made by Red Stag and as spokes-entity for the wood processing sector on Harvested Wood Products.

1

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About Red Stag

Red Stag emerged out of the 2003 receivership of the Waipa Mill in Rotorua, previously owned by the government, then Fletcher Challenge. In the intervening years Red Stag Timber Ltd has invested over $250 million to make the mill the largest in the Southern Hemisphere.

In 2021 Red Stag has also opened the country's only Cross Laminated Timber (CLT) factory, which also now produces Glue Laminated Timber. In 2022, it acquired and merged with a 65-year-old mass timber manufacturer to form Red Stag TimberLab.

Red Stag also owns a frame and truss / prefabrication factory, and property development companies. The group has invested over $325 million in total, making it now the largest investor in *new* wood processing in New Zealand's history.

Red Stag Forests also owns 5,000 ha of mainly carbon forests which are a combination of Radiata, Redwood and regenerating native.

Red Stag partners MPI on the www.midrisewood.co.nz Primary Growth Partnership to showcase and share knowledge on mass timber building design and construction.

Through 2005-06 Red Stag liaised with the Minister for Forestry and MFAT to ensure Harvested Wood Products were recognised by the United Nations climate panel. The understanding then was that HWP would be brought into the ETS in due course, to the benefit of wood processors to reward and incentivise long-term storage of CO2. HWP accounting now forms part of New Zealand's NDC calculation.

Red Stag's vertical integration, operating experience, investment expertise across the forestry - wood processing – advanced manufacturing supply chain, and active engagement with government agencies on behalf of the wider industry has given it a unique understanding of the risks, opportunities and climate contribution potential of the sector. Thank you for the opportunity to submit on behalf of the wider wood processing sector.

3

Suggested recommendations to government #1

1. Bring Harvested Wood Products (HWP) carbon storage into the ETS by issuing NZUs to wood processors.

We appreciate the Commissions openness to government working on policy to achieve this (page 67), but suggest the Commission now goes further to actively encourage the government to reward and incentivise HWP production to address the 10% emissions[1] caused by Embodied Carbon in buildings, and to trigger the broader outcomes listed in section 4. We suggest the Commission adopt the HWP Outcomes Model modelling we included herein, and recommend government pursue the 4 recommendations that will lead to the modelled outcomes.

HWP value forms part of NZ's Nationally Determined Contributions, but unlike forestry NZUs, the HWP value is not yet distributed to reward and incentivise additional investment in long-life carbon storage. This is despite some wood processors investing in anticipation that they would be treated fairly and equally to foresters that plant carbon forests, in terms of NZU distribution.

Just like carbon forests, which have expanded significantly in recent years due to the dual 'logs+carbon' income streams, if similarly incentivised, wood processing can significantly expand to reduce Embodied Carbon, de-risk forester's (including Māori/iwi) precarious reliance on the declining China Log market and reduce the need to plant 141,000 hectares of farmland in Radiata Pine. (see section 4 & the HWP Outcomes Model excel file included).

HWP distribution is a key plank of the Forestry and Wood Processing ITP Plan and was unanimously supported by those that submitted on it.

MPI is starting a 'policy dialogue' with industry on this currently but has been slow in pursuing it since being asked by the Climate Change Minister and Forestry Minister in June 2019 [2] to model a distribution scheme for wood processors. Minister Shaw confirmed in February this year that the instruction stood.

A more encouraging and detailed recommendation by the Commission in the second period plan would encourage MPI to prioritise and accelerate that policy work and the implementation.

We suggest modelling and recommending to government that HWP carbon value be distributed to wood processors via NZUs to reward and encourage investment in large-scale production of long-live harvested wood products.

3 cont...

Suggested recommendations to government #2

2. Recommend MBIE set Building for Climate Change (BfCC) targets by cutting up-front embodied carbon by at least 50% by 2030.

Approximately 10%[1] of emissions are caused by embodied carbon of buildings. This can be halved this decade during the 2026-30 period by using carbon-negative engineered wood products and lower-carbon steel from NZ Steel's new arc furnace. The 'mass timber' and engineering sectors now have the expertise to support this '<50%' target and are awaiting investment signals from the BfCC regulation and HWP scheme.

Only by optimising the use of carbon-negative wood in structures and using concrete and steel where absolutely necessary will Embodied Carbon be able to be slashed this decade.

BfCC embodied carbon cap on carbon per m2 of building type must include biogenic carbon in the calculation though. Otherwise MBIE will not have the confidence to set such a target as <50% - as international supply chains for products such as steel and cement are not de-carbonising at a sufficient rate. Some gains have been made by substituting binders in concrete for example, but their supply is insufficient for the mass New Zealand market volume, and options such as green hydrogen are early stage, inefficient energy-wise, expensive and not yet being deployed by the actual international supply chains servicing the New Zealand marketplace.

The risk therefore of not including biogenic carbon in the BfCC cap calculations is MBIE is forced to set unambitious targets dictated by tardy de-carbonisation efforts by traditional material suppliers in Asia. This means buildings will have a far worse embodied carbon factor than they could have, had the building optimised the use of CO2 (wood) in its structure. Effectively that would amount to greenwashing, which we define as '*claiming emission cuts over what would have been the case, instead of what could have been the case'.*

We suggest recommending the 50% Embodied Carbon reduction by 2030, and incorporation of biogenic carbon in all cap calculations.

3 cont...

Suggested recommendations to government #3

3. Recommend MBIE tighten up the applicability of government's lowest-embodied carbon building procurement policy

In 2021, MBIE released the 'Procurement guide to reducing carbon emissions in building and construction' [3]. It requires applicable departments and agencies with building projects over $9 million in value to select the lowest embodied carbon option. CEOs of departments can opt-out by putting a business case to the Minister for Economic Development. This policy has been successful in driving change, uptake, and the design community's embrace of engineered wood products.

However, there are two ways to enhance it:

- The $9 million is the traditional cap above which agencies/departments must apply centralised government procurement policy. There is no published basis or logic to the '$9 million' number, and many smaller projects are slipping through using high-emission products. We suggest CCC recommends lowering the cap to $1 million in the case of embodied carbon in building procurement.
- Many government agencies and departments are subject to this centralised government policy, but not all. Notably Kainga Ora. Whilst Kainga Ora uses a lot of mass timber and framing timber, a large number of projects are designed by third-party designers in high-emission structures because there is no applicable policy for them to follow. We suggest CCC recommend government applies the policy to all agencies and departments.

3 cont...

Suggested recommendations to government #4

4. Recommend government introduce a Carbon Border Adjustment Tax & phase out Free Industrial Application of NZUs

The actual international supply chains servicing New Zealand of products such as steel and cement are showing few signs of de-carbonizing.

Carbon Border Adjustment Taxes are being introduced as a means of re-balancing international trade for differences in carbon costs by country. The EU is leading this.

We support this, and the consequential reduction in free allocation of NZUs.

The taxes raised could support the administration of low-carbon programmes such as the HWP Scheme. This would replace the need to auction NZUs which suppress pricing.

4

Results of the Outcomes Model if the 4 recommendations are adopted

Thank you for taking the time to study the HWP Outcomes Model. The model demonstrates the outcomes that will flow directly from the adoption of the 4 foregoing recommendations. The CCC Consultation site only allows 1 file upload, so the model will be emailed to haveyoursay@climatecommissions.govt.nz, whilst CCC lead analyst Nancy Golubiewski has been taken through the workings of the model. The model needs to be read in conjunction with this submission.

It is forecast that a market share swing of 50% to wood will result due to A/ the demand-side stimulus of ambitious BfCC regulation and B/ tightened of the lowest-carbon building procurement policy, plus C/ the supply-side stimulus of the value of HWP NZUs for wood processors to earn, monetise and invest.

Based on that 50% market share change this decade, a range of beneficial outcomes flow directly. Some are climate related; some are economic, and some are social. Practically all outcomes affect and benefit Māori/iwi. Further they require no taxpayer funding and significantly reduce the need for farmland planting, by storing carbon in wood products longer instead of planting more trees.

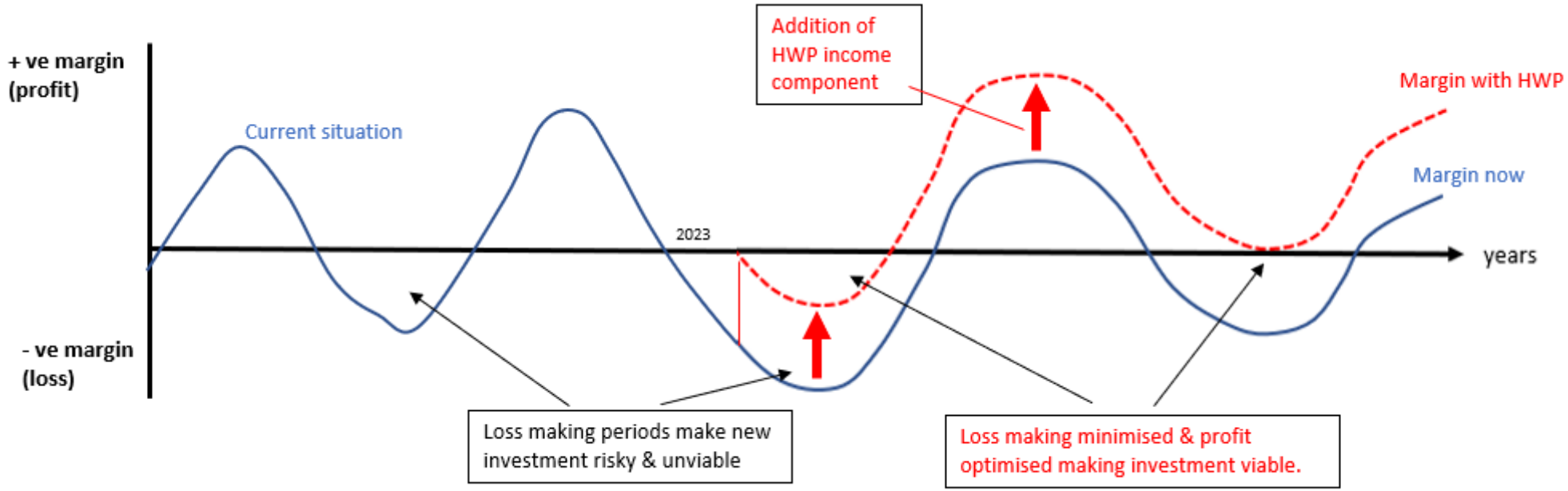
Outcomes:

- **Additional 3.1 million m3 of Harvested Wood Products produced**
- **Additional 7,700 direct employment** – mainly rural and – in Red Stag's experience – 50% Māori
- **Additional 3.5 million tonnes of logs processed domestically** – drastically reducing reliance on the declining Chinese log market.[4]
- **Additional $1.56 Billion in wood processing investment**.
- **Additional 350,000 tonnes annually in additional biomass generated** at wood processing sites (the most cost-efficient to collect)
- **Additional 1.5 million tonnes CO2 stored annually** from the additional harvested wood products M3 produced
- **Additional 3.6 million tonnes of CO2 stored annually once the product substitution component of HWP is incorporated**.
- **Reduced farm conversion - above storage is equivalent to 114,000 hectares of farmland converted to Radiata Pine**, or
- **526,000 hectares of farmland converted to Native** (saving $11.57 Billion)

RED STAG

5

How allocating Harvested Wood Products (HWP) NZUs to wood processors makes investment viable



NZ Wood processing that competes directly with international suppliers (in foreign markets or domestically) experience highly variable margin and higher cost structures due to:

- Grant-funded competitors - foreign (Aust.) and domestic (NZ Steel)
- Subsidised land, energy, rates, tax (China)
- Highest global log costs (v Aust)
- Non-tariff barriers (Asia)
- GST/VAT differential treatment (Asia)
- Market demand-pricing collapse - eg 2023 (Asia/Pac – China's construction boom is over (The Economist))
- NZD FX fluctuation (50%)

Having the HWP second income stream will overcome this and trigger large-scale investment. See forest planting example during the last 5 years.

5cont…

Allocating Harvested Wood Products (HWP) NZUs to wood processors … further points:

The Importance of NZU Allocation - Investors require positive financial feasibility across the economic cycles. Only by moving the margin profile up to the red line in the previous graphic will this occur.

Earning NZUs to trade on the ETS is a means of locking in this second income stream year-in, year-out across the cycle. By contrast, relying on annual government budget rounds or the whim of changing political appetites will not give the investment confidence required to trigger scale investment.

Nor will government debt, like the fairly insignificant $45m facility to encourage wood processing announced in April 2023. That facility is no different to (abundant) bank debt, requiring interest and repayment of it to be factored into product pricing. It therefore does not move the margin curve to the red line in the graphic required to attract investment. The article '***Wood processors to Minister Henare – we want our carbon, not your debt***' explains this further [5]

An 'Industry Good' Fund has been mooted. This will not achieve the goals, as it will not move the margin curve to the red line by creating a dual income stream. The success of the allocation of NZUs to forest growers, and the subsequent boom in forest investment, demonstrates that only direct incentive to investors in the form of NZU allocation will trigger investment.

Who best to distribute HWP value to - In 2019 MPI commissioned Scion to research whether HWP value is best allocated to *foresters* or *wood processors* to generate more long-life wood products and additional HWP value. The finding was 'wood processors' is most effective in driving change. [6]

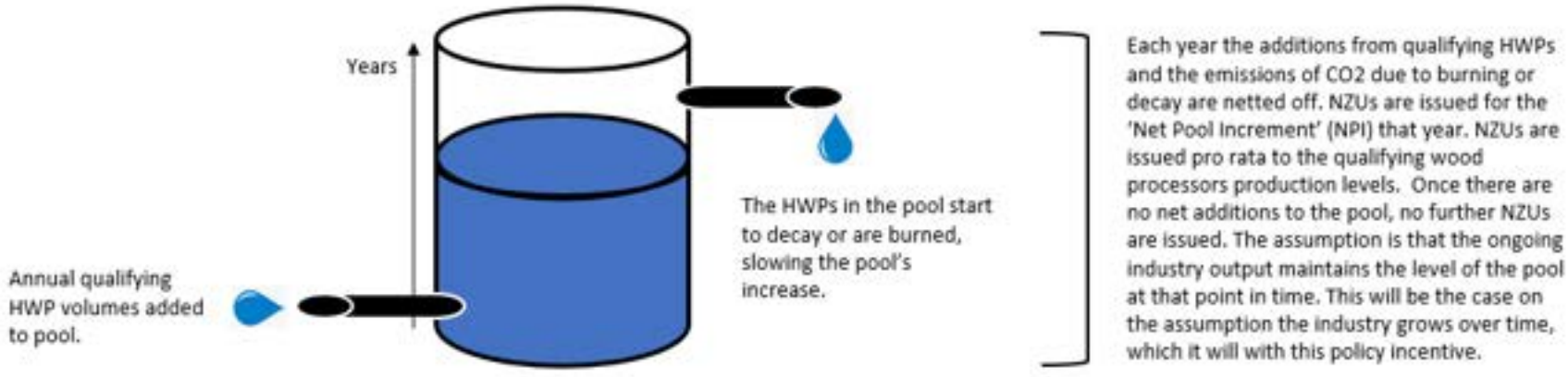
In 2021 the European Union commissioned research into whether carbon value is best distributed to property developers or wood processors. Again, the finding was 'wood processors' is most effective in driving change. [7]

In 2019 the Cabinet ministers' decision was to distribute it to wood processors, and the sectors awaits the mechanism to be implemented.

HWP scheme structure concept

HWP's carbon value is well researched and quantified at a wood processor level as part of Nationally Determined Contributions calculation. A simple scheme to take that annual research, run HWP mid-life carbon calculations per processing plant, and issue NZUs would be a simple and credible way to reward and incentivize additional HWP production and deliver the HWP Outcomes Model.

Possible Scheme Design - A scheme design concept could simply adopt the forestry stock change approach, whereby a hectare of forest is planted to store carbon but reaches a point in the future as the forest matures where the sequestration matches the emissions from the forest. The owner earns NZUs until that point and must then maintain the stored carbon in the hectare. Here we propose a permanent HWP Scheme 'pool' be established, that is topped up over time by additional Harvested Wood Products, netted off against emissions from the pool.



A 'Production' approach is proposed, so as to avoid double counting of emissions/reductions depending on how international trade competitors have approached HWP. This also means the 'pool' does not touch the HWP value of logs exported and processed overseas. That benefit can be retained by the government.

6 cont...

HWP scheme structure concept…

Additionality - A grandfathered 'site processing capacity' date needs to be established to ensure 'additionality'. Forestry adopted 1 Jan 1990. 2003 was a turning point in UN recognition of HWP and would make sense. Conversely, a grandfathering date of 2023 would mean few participants could take part due to the recent spike in HWP production. It would also deprive those that have been investing in good faith since 2003 the ability to recuperate return from those investments (as 1990s foresters got to).

Environmental Integrity - How the pool is allocated and who has responsibility for topping it up once the additions start getting close to releases from the pool in decades time will also need to be established. It could be that individual companies take responsibility for their slice of the pool storage-emissions annually (like post-1990 forest land). That would work for financially-secure well-run businesses. A vetting criteria could be established if this approach was followed, to ensure longevity.

Or it could be that a net change to the pool level is calculated each year, with NZUs distributed pro-rata to contributing wood processors based on their additions to the 'pool'. In this case, the simple assumption could be that the wood processing sector as a whole will continue to top up the pool once net distribution of NZUs stops (like pre-1990 land). It is a safe assumption that the wood processing sector will be operating and producing long-life products in one, two, three hundred years, so this assumption has little environmental integrity risk.

Govt retains much HWP benefit - It should be remembered that the 'pool' would only apply to domestic processing above a grandfathered level of production at each site. The grandfathered component and the HWP from NZ logs processed overseas would continue to accrue to the government. That retained benefit could be used to administer the 'Pool' as well as a buffer volume should the HWP Pool scheme ever have a year when pool emissions exceed storage for any reason such as construction downturn.

The HWP value component from substituting out high-emission materials could be easily researched, modelled and updated annually as EPDs change over time.

In summary, there are a few design options for MPI, MfE and industry to work through, but each has a form of precedent in the working of the current ETS to draw on.

7

Summary

In summary, there are 4 areas we suggest the Commission make strong recommendations to government to develop:

1. **HWP NZU distribution to wood processors**
2. **A 50% Embodied Carbon reduction commitment by 2030 within the Building for Climate Change regulation, and calculations to include biogenic carbon.**
3. **Strengthening of government's lowest carbon building procurement policy to include all agencies and departments and lowering the project value applicable threshold to $1 million.**
4. **Recommend government introduce a Carbon Border Adjustment Tax & phase out Free Industrial Application of NZUs by 2030**

All 4 are either underway or under design, so are not risky or without political support. All 4 do not require taxpayer funding.

The environmental, economic and social benefits – including to Māori/iwi - that flow directly from the adoption of these recommendations are significant and have an asymmetrical reward-risk profile. They warrant Commission recommendation to encourage their full implementation in the 2026-30 period. Thank you in anticipation.

Footnotes

1. Includes consumption and production emissions
2. The 2019 memo reference: AM19-0486 and 2019-B-05721 (MPI and MfE references)
3. Procurement guide to reducing carbon emissions in building and construction - https://www.procurement.govt.nz/assets/procurement-property/documents/procurement-guide-to-reducing-carbon-emissions-in-building-and-construction.pdf
4. Reliance on China for logs and to underpin plantation forest investment. In May 2023, The Economist magazine declared China's construction boom over. For more analysis on the risks to NZ foresters from relying on China, see NBR's 'Who will buy our billion trees?' https://www.nbr.co.nz/opinion/who-will-buy-our-one-billion-trees/
5. 'Marty Verry: Wood processors to Minister Henare – we want our carbon, not your debt' - https://www.nzherald.co.nz/business/marty-verry-wood-processors-to-minister-henare-we-want-our-carbon-not-your-debt/3U3Y4BFHMZCE5BHP6FR6Y4YU24/
6. Held by Red Stag and MPI, and not uploaded to web..
7. EU research: 'Evaluation of the climate benefits of the use of Harvested Wood Products in the construction sector and assessment of remuneration schemes' https://op.europa.eu/en/publication-detail/-/publication/eb9de1f4-2c93-11ec-bd8e-01aa75ed71a1

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10 August 2023

Ministry for the Environment Manatū Mō Te Taiao
ETS Review
Ministry for the Environment
PO Box 10362
Wellington 6143

Email: etsconsultation@mfe.govt.nz

Christchurch City Council Submission on the review of the New Zealand Emissions Trading Scheme (NZ ETS)

1. Introduction

1.1. Christchurch City Council (the Council) is a participant in the NZ ETS and is interested in the effectiveness of the NZ ETS in helping to reduce emissions in our organisation and district.

2. The Council's greenhouse gas emissions reduction targets

2.1. The Council has adopted ambitious emissions targets:

- The Council will have net-zero operational emissions by 2030.
- The Christchurch District will halve its emissions by 2030 compared to 2016-2017 levels and achieve net-zero emissions by 2045.

2.2. To achieve these targets, we aim to reduce greenhouse gas emissions wherever practicable. However, it is likely that some emissions from 2030 will need to be offset.

2.3. Actions are needed to sequester carbon, and to do so in a measured, credible and effective way in line with Council's other objectives around protection of the natural environment. This will support Programme 5 'Carbon removal and natural restoration' in the Kia tūroa te Ao Ōtautahi Christchurch Climate Resilience Strategy and Goal Two of the Ōtautahi Christchurch Urban Forest Plan, 'Our urban forest thrives with healthy, diverse, and resilient trees.'

3. The Council's participation in the NZ ETS

3.1. The Council has 206 ha of land registered in the NZ ETS, where stock grazing leases were reduced to allow for regenerating indigenous forest. Registration of NZ ETS-eligible native regeneration or planting on Council land then earns New Zealand Units (NZUs) which the Council can use to offset any residual emissions that are not compliant with our targets.

Christchurch City Council

3.2. It is likely that the Council will seek to register further forested land in the NZ ETS in future.

3.3. The NZ ETS was selected because of its credibility and durability (being a government scheme). We strongly support any measures to improve its efficiency and effectiveness.

4. Right tree, right place, right function

4.1. Council regeneration and planting is not for industrial purposes, and it is very unlikely to be cleared/forested. We wish to ensure that the benefits and goals of those pursuing NZ ETS-eligible planting for emissions reduction and the co-benefits of environmental restoration are noted.

4.2. As guardians of our natural environment and taonga, the Ōtautahi Christchurch Urban Forest Plan expresses the Council's vision of 'right tree, right place, right function', where 'trees are grown in locations that allow them to reach maturity and benefit the local environment'.

4.3. The NZ ETS could benefit both emissions reduction and the environment by going further than counting the amount of carbon drawn down by a particular tree. We support extension of the NZ ETS to provide a framework to recognise other carbon sequestration systems, such as wetland restoration.

4.4. Emissions reduction is the foremost goal. However, support of sequestration is also important, as well as recognition of the co-benefits of sequestration done using sustainable methods. These benefits include slowing and intercepting rainfall, reducing erosion and sediment, protecting biodiversity, producing oxygen, contributing to property values, mitigating extreme heat, filtering air borne pollutants, and improving physical and mental health.

5. Conclusion

5.1. The Council considers the NZ ETS to be a potentially important tool for achieving greenhouse gas emissions reductions in our organisation and district. We support the aim of the review to make the ETS fit for purpose. We urge the Government to establish long term stability for the mechanisms of the NZ ETS, so that the Council and our communities have some certainty for decision-making.

For any clarification on points within this submission, please contact Hannah Lewthwaite at [redacted]

Yours sincerely

Helen White
Acting Assistant Chief Executive
Strategic Policy and Resilience

Submission

Review of the New Zealand Emissions Trading Scheme

Submission to:

NZS review
Ministry for the Environment
PO Box 10362
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11 August 2023

Contact Details

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Submitter

City Forests Limited

City Forests (CFL) is a Council Controlled Trading Organisation wholly owned by the Dunedin City Council and is a major land and forest owner in the Otago region. The company has over 25,000 hectares of mostly freehold land including more than 20,000 hectares of productive plantation forest. The remainder includes over 2,400 hectares of area that we have set aside for permanent ecological reserves. In 2006 the company celebrated 100 years since its first forests were planted. Much of the company's plantation forest area is now on its second or even third rotation as a commercial forest crop.

Of the company's productive plantation forest holdings, approximately 5,700 hectares is currently registered as post-89 forest under the Emissions Trading Scheme (ETS), with several thousand hectares awaiting future registration. The remaining area is registered as pre-1990 forest.

CFL has been an active participant in the ETS since its inception, and we have reinvested, almost dollar for dollar, the proceeds from our carbon unit sales into creating new forest areas.

Introduction

The ETS review discussion document (the Review) signals major changes to forestry ETS settings which could result in enormous value being stripped from forestry companies such as CFL. We believe the Review is guilty of pursuing a poorly conceived approach to its advice, founded on dated data and incorrect modelling assumptions.

The Minister of Climate Change and the Minister of Forestry both acknowledge the importance of forests in their opening statements to the Review. The Minister of Forestry says for example that, "We need to act now to tackle climate change – and we need to use every tool available", and that New Zealand, "needs significant afforestation to meet … emissions reduction goals". However, the Review and its proposals, along with recent Government mismanagement of ETS auction settings have already seriously eroded confidence amongst current and potential forestry investors, including City Forests, which has abandoned firm plans for further afforestation.

The loss of confidence amongst investors calls into very serious doubt the modelling produced to support the options proposed, and the underlying assumption in the Review that forestry will significantly overshoot previously targeted offset volumes. In fact, at a belated disclosure of the modelling during a workshop held on 27th July which CFL attended, officials admitted that the modelling was "not responding to what was happening on the ground".

We are surprised that MfE, grown purportedly to now more than 1,000 staff[1], cannot produce credible and up to the minute modelling advice based on real world data, for a review as important as this one which profoundly affects a sector worth more than $6.5 billion in annual export earnings to the NZ economy. The result, it seems clear, is that the Review is based on questionable assumptions, and that the primary objective of the Review instead, is to create an incentive scheme for forestry outside of the NZ ETS rather than allowing the ETS to continue operating successfully to lower the country's net emissions in order to meet NZ's international climate-change obligations in a least cost, lowest risk and most efficient manner, as has been long designed, intended and functioning.

The Ministers' opening statements create the expectation that major changes to ETS settings for forestry are a desired, and we suspect, even a predetermined outcome. Consequently, the Forest Industry, including CFL is somewhat suspicious of the Review, which largely mirrors the Climate Change Commission's projections of a massive surplus of forestry NZUs subsequently collapsing NZU prices in the 2030s. The Review seeks to use it, we believe, to reach the conclusion the Government appear to favour - Option 4. CFL therefore questions whether this consultation is to some extent going through the motions, without having a genuine intention of listening to affected parties?

By contrast, and importantly, we note that international estimates are that the world is projected to need at least 400 million hectares of plantation forest in order to stave off the worst effects of climate change and to meet burgeoning global demand for wood fibre. Current estimates of global afforestation are 292 million hectares, so there is a long way to go[2], and NZ must play its part, which the Review ironically reiterates in an opening statement (p10). It is striking therefore that New Zealand's political leaders are seeking to rein in the growth of afforestation in this country – in effect to hamstring the only part of the ETS that was, until this present uncertainty was introduced, functioning as intended.

We reiterate, that the highly productive, well proven, and expertly grown and managed NZ production forestry sector is one key pathway NZ should continue to pursue. It is the least-cost and lowest-risk route to a net-zero emissions' future for NZ, and in addition will provide significant and important future export earnings for the economy, and many non-forest benefits to local communities.

Specific submission points:

1. Fundamental changes are being proposed on the basis of what we believe is, inadequate analysis and questionable assumptions about forestry offsets supply. The Review raises concerns about the large supply of NZUs in NZ's ETS stockpile (page 18) and refers to the Climate Change Commission's (CCC) 2021 estimate that this was around four times the number of units surrendered in 2021. We note that those figures are two years old, and much has happened since then including a number of failed auctions, with more likely. The stockpile is nowhere near its previous level and even then, caution is needed in assuming that these units are all "available". We question the Review's fundamental assumptions. For example, in its July 2022 advice on NZ ETS unit limits and price control settings for 2023 – 2027, the CCC determined that an estimated 52 million existing forestry NZUs were not part of the "surplus" NZUs in existence

[1] Refer Michael Reddell, "croaking cassandra", 03 August 2023

[2] WWF, "Everything from Wood, The resource of the future or the next crisis?", July 2022

at that time. This was because they were not available to the market, being held by existing forestry participants to meet future harvesting obligations. Therefore, they are unlikely to present risks to emissions budgets (July 2022 advice, page 40). CFL is one such participant that is holding many NZUs at a zero value in order to meet our future surrender obligations. We no longer think it is accurate to include a statement in the document that the current size of the stockpile may limit the effectiveness of some of the options (page 19).

2. We agree that the government should be continually evaluating its progress against the CCC recommendations, the likely achievement of carbon budgets, and our NDC. However, we do not agree with the premature conclusion that this is currently necessary, and that the only option is to constrain forestry units. CFL is particularly opposed to options 3 and 4 proposed in the Review.

3. It is recognised the NZ ETS has been the main tool for reducing greenhouse gas emissions over the last 14 years (page 6). We acknowledge that minor adjustments will be needed from time to time, but it is also important to maintain as much consistency as possible for long-term investors, and to exercise great caution in proposing any changes that are not supported by very robust analysis. In that respect then we note particularly the statement in the Review that "before the government makes its final decisions on the NZ ETS review, detailed modelling and analysis will be undertaken". It is clear that there is little present understanding of how these inadequately informed proposals will impact existing NZUs or registered forests (page 54). The Review admits the evidence and assessment of cost abatement curves is not well developed, and that further analysis will definitely change what officials consider to be the optimal pathway (page 34). We consider that the ETS is a world-class scheme, it is not broken, and the instability seen in recent times has been more about the Government's lack of commitment to earlier CCC recommendations than with any structural problems with the system.

4. As noted, (page 55) there are other options already at the Government's disposal that could be employed but that have not been. These should be utilised first before concluding that the system is broken and needs major surgery. Key amongst these options is constraining the supply of units through auctioning, and reducing the supply of free NZUs to "at risk" industries.

5. CFL agrees that an increasing carbon price will ordinarily result in an increasing level of afforestation – this is a natural outcome of the ETS functioning as intended. However, there are multiple policy and regulatory measures emerging that are going to constrain future investment in forestry. While the document does, numerous times, acknowledge that afforestation will need to be encouraged somehow this is nothing more than conceptual at present and provides no reassurance to investors. The limitations to the analysis are starkly summed up in the acknowledgement that "it is not possible to predict with certainty how private actors will respond to policy changes", nor any "changes to removal activities" nor even "future rates of afforestation". Our "insider" view is that in the near term we expect a considerable drop in the level of planting, which will take time to reverse, even assuming positive encouragement of forestry is restored. Investment confidence has been severely dented and may take much longer than expected to fully reverse.

6. Multiple times the Review notes that the ETS was not designed to create a separate pathway for emitters, and then the conclusion is drawn that therefore the ETS is faulty for not doing so, and one is needed. We do not accept that without a separate pathway the ETS cannot provide an

adequate signal to emitters. In fact, there are also ample other drivers, such as science-based targets, net zero reporting for NZX 200, central and local Government pressure (with maximum 10% offset), as well as substantial investor and consumer pressure. These will ensure that gross emissions' reductions will continue to be prioritised, largely irrespective of forestry offsetting. The prime reason the ETS has not consistently done so and that we have not had the desired increasing price to this point is because the Government has failed to follow the Climate Change Commission's advice or, itself, intervened unnecessarily in the supply to market, and has unnecessarily subsidised some exposed emitters.

7. The Review also notes in a number of places (e.g. pages 14 & 20) the additional desirable benefits that forestry provides in addition to removing carbon dioxide from the atmosphere including enhancing indigenous biodiversity, improving freshwater outcomes, providing economic opportunities for landowners, particularly on "land that may otherwise be hard to make a living from", and providing erosion control. What is not mentioned, but is also highly relevant, is that afforestation also reduces biogenic methane emissions through displacement of ruminant livestock (so a gross emissions reduction), and the increasingly important reliance on forestry to supply bioenergy needs.

8. We wish to point out in response to the Review, that CFL's forests are no less an intergenerational asset than Maori forest assets and should therefore attract the same relief and incentives as those proposed for Maori. CFL considers that it is a very long-term custodian of its forests, for future generations, no less than Maori foresters. In fact it could be argued that Maori forest owners' general record of commercial management and investment in forestry is at best, historically variable in that respect compared to that of CFL. The people of Dunedin (which includes members of local Runaka), ultimate owners of the company's forests, have strong, often multi-generational connections to the land and forests. The ETS review fails to recognise this possibility in its overt concern with effects on Maori forestry interests.

9. We consider that the level of consultation with the forest sector (one of the key sectors impacted by the proposals has been inadequate). We note for example, that webinars were made available for iwi, the public and youth but none, or only very belatedly and on a limited scope, for the forest industry. Furthermore, changes are being proposed on the basis of draft advice from the Commission without waiting to see if this advice is subsequently amended on the basis of the consultation already being undertaken by the Commission. All of this suggests a pre-determined outcome and not genuine interest in alternate views.

10. In summary, CFL echoes the wider forest industry's grave concerns that significant decisions around land use and the Emissions Trading Scheme are happening on a preconceived basis without proper consultation and without detailed consideration of the significant flow-on effects – which are already starting to play out. We consider that, in a drive to deliver greater gross emissions reductions, New Zealand will instead end up failing to meet its net reduction targets – an order of magnitude bigger problem.

Consideration of the specific Options Presented

Option 1. Use existing NZ ETS levers to strengthen incentives for net emissions reductions (page 55).

City Forests strongly favours this option over all other options presented.

There are several pathways open to government under existing settings to reduce supply and CFL believes that these should be used to drive gross emissions reductions as the ETS was intended to do. We agree that an increasing carbon price will generally result in an increasing level of afforestation. However, there are multiple other policy and regulatory measures under development that will constrain future investment in forestry. We have also seen how easily recent regulatory uncertainty and the mismanagement of auctions has severely dented confidence in future afforestation investment. In the near term we expect a considerable drop in the level of planting, which will take time to reverse, even assuming positive encouragement of forestry is restored. If government exercises some of the options at its disposal such as restricting its own supply of units to auction and reducing industrial allocation this will absorb a significant level of any new supply from forestry. We are not convinced that there is sufficient evidence to conclude that forestry is in an over-supply situation, or will become so.

Option 2. Create increased demand for removal activities to increase net emissions reductions (page 58).

Like the FOA we see little downside in the government providing itself with the ability to purchase NZU's outside the ETS. This is not a mutually exclusive option and does not prevent the government from taking other action if required, but it does provide the Crown with another control lever. We also agree with the FOA however, that there will be close to zero interest from offshore emitters if they cannot claim the reduction themselves.

We also note the reference to incentivising removals with co-benefits (page 61). We believe that insufficient regard has been given to the huge number of non-forest benefits that NZ's well managed production forests provide, just as native forests do, such as enhancing native biodiversity, and good social and cultural outcomes. In addition, NZ's production forests provide significant employment and economic benefits, which are generally not available from native forests to anywhere near the same extent. These benefits are well understood and recognised by the forestry sector and its beneficiaries, and we encourage the Government to become better informed as to the breath and quality of these, which are very significant.

Option 3. Strengthening incentives for gross emissions reductions by changing the incentives for removals (page 62).

CFL is strongly opposed to option 3 on the basis that:

- The justification for it has not been demonstrated.
- Because the extent and timing of intervention by the government will be unknown it will significantly, and negatively, affect investor confidence.
- Retrospective imposition of rules on those who have already invested is not being ruled out and this is already having a negative impact on investment and forest management behaviour.
- It will, as conceded in the Review, result in less removal activity.
- There are other, better, options, if needed.

As discussed above we consider that there are already numerous actions in play that we expect to constrain the interest in forest planting and removals for the ETS. CFL believes that Option 3 would exacerbate that problem.

Option 4. Create separate incentives for gross emissions reductions and emissions removals (page 65).

CFL is strongly opposed to option 4 on the basis that:

1. The justification for it has not been demonstrated.
2. This option has the potential to make the system so complicated as to be unworkable and at best ineffective.
3. It will add considerable and unnecessary cost.
4. Retrospective imposition of rules on those who have already invested is not being ruled out and this is already having a negative impact on investment and forest management behaviour.
5. It will, as conceded in the document, result in less removal activity.
6. There are other, better, options, if needed.

Furthermore...

7. This option is very concerning given the lack of analysis to support it and the lack of any detail about how the second removals market would operate. It is an option that should have been consulted widely on with the forestry sector after final advice was received from the Climate Change Commission, and at a time when sufficient detail could be provided to assess whether it could achieve its objectives. As noted, design and confidence are completely unknown at this point and there is an implication that it will take a long time to design and implement (page 67).
8. Monitoring and managing dual systems is likely to very difficult for both participants and the crown. Based on the very high costs of the existing ETS, there is every reason to expect that this will be multiplied.
9. The option has also not ruled out the government becoming the single purchaser of units and removing the element of competition. This will certainly further undermine confidence and leaves the actions of the purchaser open to other than the core functioning of the market.
10. This option fundamentally alters the basis upon which existing removals' investors have chosen to voluntarily participate in the ETS. We also note that a further rule change mid-investment of placing restrictions on the removals' stockpile has also not been ruled out.
11. We consider that it is an abuse of governance, and it is extremely concerning for existing forestry ETS property rights holders that the Government has failed to confirm, either in the Review or subsequently, that existing forests and NZUs so sequestered from them, will be grandfathered from the ETS changes contemplated by the Review.
12. Again, our earlier comments, noted under option 3 above, on the multiple co-benefits from production forestry, is reiterated. CFL does however support the recognition of any legitimate (internationally recognized and credible) removals including additional vegetation on farmland, wetlands and pre-1990 forestry. This support, however, is conditional on the removals meeting the criteria outlined on page 73, that is, additional, permanent and scientifically valid. New Zealand has, thus far, established a robust and internationally credible measuring and monitoring system. This should not be put at risk by allowing removals to be recognized that cannot meet these criteria, or introducing costs that are unjustified.

Conclusion

It is City Forests' firm view that the ETS has been functioning exactly as intended with respect to driving much needed plantation forestry expansion. In fact, it appears to be the only sector which was currently delivering on its role to reduce NZ's net emissions, and in particular to buy NZ time to also reduce gross emissions elsewhere – that is, until recent uncertainties were introduced. The effect of generally implementing either of options 3 or 4 in particular, will be to further significantly undermine confidence in the industry and drive important capital away from investing in the sector. We note that the NZ plantation estate is only just now reaching the size it was in the early 2000s and needs to grow much larger if the country is to successfully and affordably meet its NDC or 2050 targets, or to contribute meaningfully to net global initiatives.

Because the ETS review is relying on a series of flawed assumptions, including its focus on gross rather than net emissions targets, we believe it has made a flawed recommendation on forestry, and this has already had a significant market impact. This includes a $33mill devaluation in balance sheet value for CFL alone, as at 30 June, and capital expenditure plans for future new land investment abandoned. The shock waves of this dramatic change in recommendations are being felt around the industry. The inevitable result has been that the only part of the reduction pathway that is actually delivering has been cut off at the knees, and future estimates of new forest planting now should be reduced to just fraction of previous estimates. We consider that this is a tragedy both for NZ, and for international net emissions reductions!

In conclusion, we reiterate that NZ has a world-class emissions trading scheme, which up until the advent of recent political interference, was doing exactly what it was designed to do for plantation forestry and NZ's net emissions. Rather than the damaging uncertainty of ill-considered changes, the ETS should be left alone to function as originally intended, as a least-cost and least-risk pathway for NZ to meet its emissions' reduction targets.

Note on making this submission public

We do not object to this submission being made public.

Peter Oliver
General Manager, Forest Assets
City Forests Limited

Submission: NZ ETS review

Christina Hood, Compass Climate

1. Introduction

The ETS is a key piece of New Zealand's climate policy architecture and is a powerful lever for change.

It is not possible to properly assess ETS design without clarity on the outcomes that are sought. These consultation options are presented in a confusing way, as they bundle together different outcomes for "balance" between gross reductions and forestry removals with different ways of achieving those outcomes. There is also insufficient detail provided to assess the options in any depth. This submission therefore focuses more on higher-level objectives than the proposed options.

Consideration of ETS design would also be clearer with more focus on quantities rather than only price. A lot of the consultation document is framed around reaching a necessary ETS price level to drive gross reductions. I would put it differently: the ETS cap is the allowed level of emissions. If we wish to limit gross emissions, then gross emissions will need to be capped (either directly, or by limiting the ability to offset with forestry removals). However even with a gross-only cap, the price in the market is not pre-determined: the price discovered will result from ambition of the gross reductions path and by what other supplementary policies are used.

I was astonished that the document does not acknowledge the importance of how NZUs that have already been issued will be treated, nor forests that are already registered in the ETS. Some early in-principle decisions giving comfort that these will be treated fairly will be important. I note that full grandparenting could constrain some reform options, and splitting the stockpile between forestry and gross systems would be very challenging. However we should not create a situation where the speed of New Zealand's gross emissions reductions is constrained by a commitment to grandparent units or forests: alternative ways of providing fairness can be found.

Finally and more broadly, I would urge the government to re-ask the highest level question: what is the ETS for? What do we want and expect it to achieve? This consultation process is an opportunity to crystallise a clearer view on the role of the ETS in the policy mix and in New Zealand's transition path, re-looking at its effectiveness and role in different sectors, and how it can be made more equitable (particularly if prices are to rise substantially).

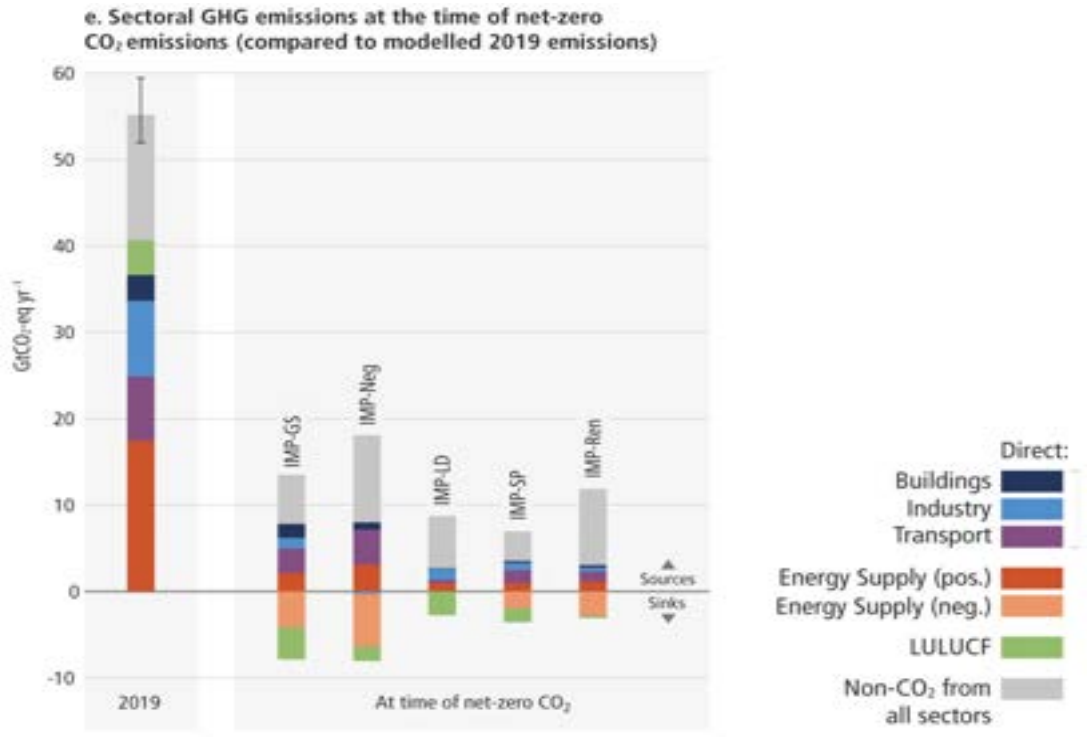
2. Gross emissions reductions in global 1.5C scenarios

The current ETS design was as a compliance mechanism for international targets, mapping the net emissions budgets of the Kyoto Protocol onto the domestic economy, and allowing trading and international linking to lower costs. That was arguably a reasonable approach when the objective was compliance with incremental net targets: it literally did not matter for compliance whether gross reductions occurred.

However, the goalposts have shifted substantially: countries are now aiming to make a transition to near-zero gross fossil fuel emissions, and will also need significant removals (through forestry and technology) to pull back the inevitable overshoot in CO_2 emissions. Coupled with deep reductions in non-CO_2 gases including agricultural methane, this is what below-2C pathways look like at the global scale.

IPCC scenarios

In the IPCC Sixth Assessment Working Group III report, a set of "illustrative mitigation pathways" show a range of possibilities for how temperature targets can be achieved. The figure below shows current emissions as well as modelled emissions and removals when net-zero CO_2 is reached in pathways that hold temperature rise below 2 degrees.



An extract from Figure SPM.5 of the IPCCC Sixth Assessment Report Working Group III Summary for Policymakers. IMP-GS is a <2C scenario with 67% probability; IMP-Neg is <1.5C 50% probability with high temperature overshoot, and IMP-LD, IMP-SP and IMP-Ren are <1.5C with 50% probability with no or limited temperature overshoot.

It is immediately obvious that gross CO_2 emissions are massively reduced in all these scenarios: by over 80% in the <2C and <1.5C high-overshoot scenarios, and by over 90% in 1.5C scenarios with no or limited overshoot. In these pathways non-CO_2 emissions like methane are also deeply reduced (grey bars), but are not net-zero: for example the reduction for agricultural methane from the IPCC Special Report on 1.5C of Warming is 24-47% globally in 2050.

Most of the removals occur within the energy sector [labelled 'Energy Supply (neg)', orange bars], such as from bioenergy carbon capture and storage (BECCS) or from direct air capture (DAC), technologies which store CO_2 permanently underground. There is very little offsetting with removals from land-use, land-use change, and forestry [labelled 'LULUCF', green bars]. **Globally only 4% of the initial CO_2 emissions are balanced by land sector removals at net-zero in these scenarios.**

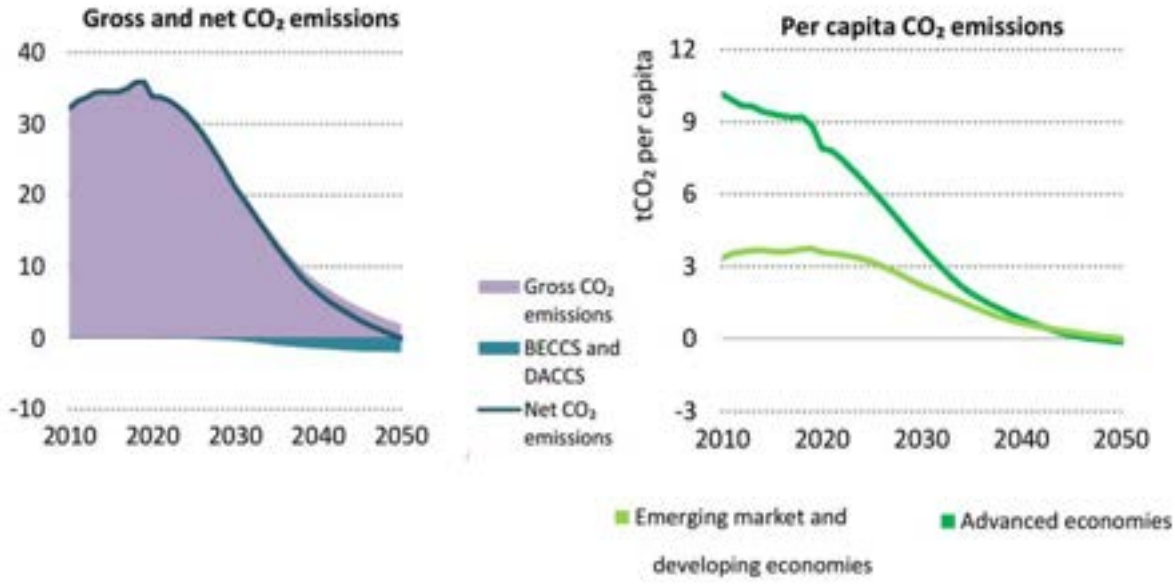
So while CO_2 overall is "net zero" around 2050 in the low and limited overshoot scenarios, this is actually made up of over 95% reductions within emitting sectors (including geological removals), and only a very small fraction of residual emissions are balanced by land sector removals.

IEA net-zero energy scenario

Similarly, the International Energy Agency's net-zero energy (NZE) scenario is a <1.5C scenario with low/limited overshoot, and assumes no offsetting with land sector removals. As in the IPCC pathways, gross emissions are cut by well over 90%, with the remainder balanced by removals within the sector (BECCS and DAC).

The NZE has per-capita emissions convergence between developed and developing countries at around 1 tonne per capita in 2040, and net-zero globally in 2050. However it is worth noting that developed countries' responsibility is not only for their own emissions reductions: developing countries' ability develop and provide universal energy access, while holding emissions to 3t/cap and below, is only possible with climate finance and carbon market funding.

New Zealand's energy and industrial emissions were around 7 tonnes per capita in 2021, broadly similar to the advanced economy average (7.9t in 2020), although the IEA numbers also include international aviation and shipping. If New Zealand aspires only to remain average for an advanced economy, that would mean dropping per-capita CO_2 to 3.8t in 2030 and 0.8t in 2040.



Gross and net CO_2 emissions, and per capita CO_2 emissions in the International Energy Agency Net-Zero Energy Scenario.

Science-based Targets Initiative

The Science-Based Targets Initiative (SBTi) aims to provide 1.5C benchmarks for corporate target setting. Consistent with the IPCC pathways and IEA NZE, the SBTi cross-sector pathway reduces gross emissions by at least 42% by 2030 and 90% by 2050 levels before considering the effect of CO_2 removals.

Implications for New Zealand

New Zealand's Climate Change Response Act currently sets a net-zero target in 2050 for long-lived gases, but allows this net target to be met by any combination of gross emissions reductions and CO_2 removals from the land sector. This is out of step with the global-scale pathways consistent with 1.5C, which have deep reductions in gross emissions and only a small quantity of residual emissions offset.

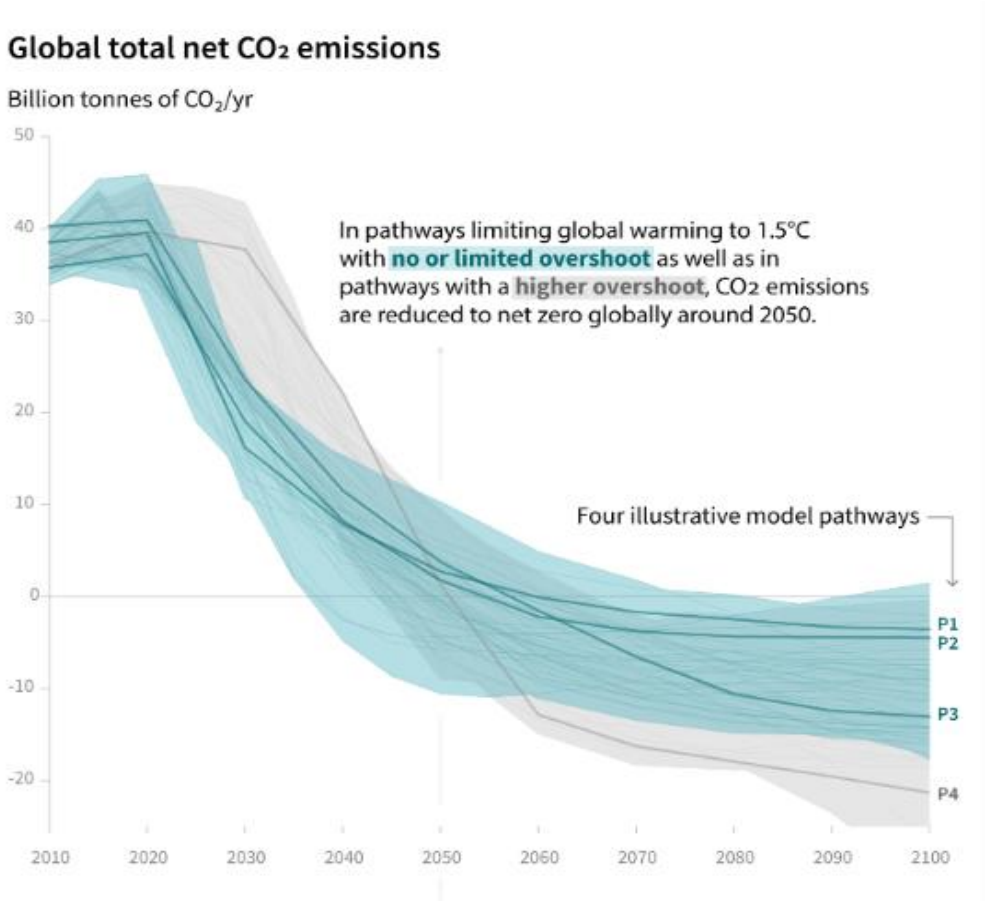
As a historical note, it was not originally the intention to allow New Zealand's high forestry potential to delay domestic emissions reductions. At the time of the Kyoto Protocol negotiations (when the "net" target formulation was first developed), the New Zealand government Q&A said the following:

> *4.Will the inclusion of sinks mean that New Zealand has to do nothing about emissions?*
>
> *No. Including sinks in the manner proposed by New Zealand would not protect emitters from facing up to the costs of adjusting to lower levels of emissions. New*

Zealand has pledged that it will place any 'credits' from forest sinks onto the world market meaning that New Zealand sink credits will be available to all developed country emitters. On the other hand, New Zealand emitters would have access to the least costly abatement opportunities wherever they occur within developed countries. Trading effectively creates a 'world price' for emissions that all players would have to face.

3. CO_2 removals in global 1.5C scenarios

In IPCC scenarios consistent with keeping temperature to <1.5C, the world exceeds the carbon budget consistent with 1.5C, and needs to compensate by permanently removing a substantial quantity of CO_2 from the atmosphere with technological and nature-based solutions. This requires net-negative CO_2 emissions globally in the second half of this century. The figure below shows that if there is a delay in gross emissions reductions (the grey vs blue sets of scenarios) then emissions need to be even more negative after 2050 to compensate.



In IPCC 1.5C scenarios, global CO2 emissions are net-negative in the second half of this century to draw down overshoot of the emissions budget for 1.5C (Figure SPM.3A of IPCC Special Report on Warming of 1.5C).

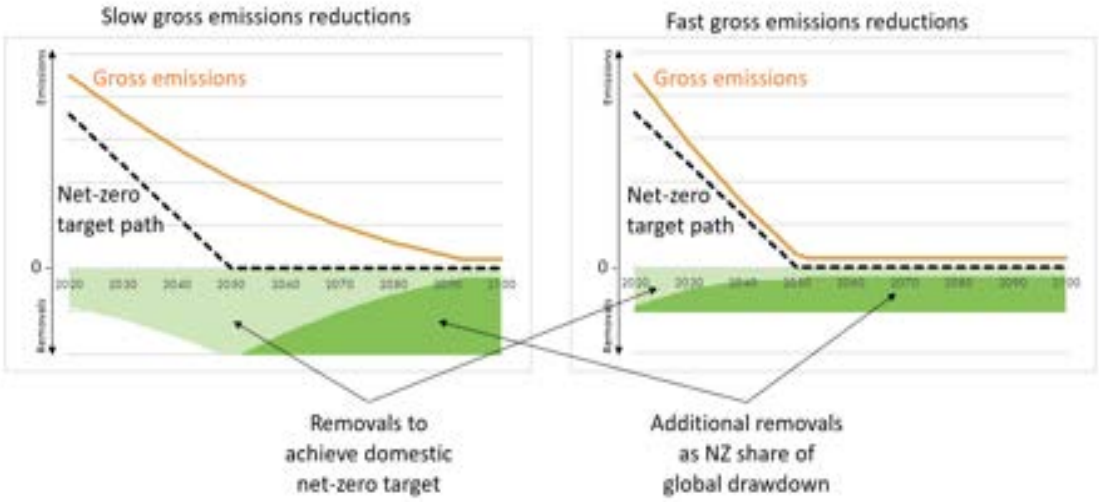
The IPCC Sixth Assessment Report Working Group III Summary for Policymakers (Table SPM.2) quantifies the necessary level of net-negative CO_2 emissions between the time of net-zero and 2100. This is around 220Gt cumulatively to 2100 in 1.5C scenarios where global emissions fall extremely rapidly starting immediately, and 360Gt in scenarios where there is a larger overshoot, which seems inevitable at this point. Note that the total quantity of removals will be even larger than this, because there are still some residual gross emissions that also need to be offset to achieve and maintain net-zero.

Implications for New Zealand

New Zealand emissions have contributed to exceeding the global carbon budget. Ministry for the Environment calculations put our historical share of net CO_2 at 2.6 times the global per-capita average. A significant part of New Zealand's contribution to warming since 1850 is a result of deforestation, which makes a higher contribution to current warming than fossil fuels emitted so far (and current warming from agricultural gases is higher than each of these).

Along with other developed countries and large emitters, New Zealand will need to play a part in drawing down excess CO_2 from the atmosphere. A 2.6 times per-capita share of 360Gt could be well over 500Mt of net-negative emissions cumulatively by 2100. However our fair share would not just be to correct our per-capita contribution, but would also take into account our capacity as a rich country, and our ability to act (as a country with deforested land able to be restored and geology suitable for CO_2 storage). As such, New Zealand could be responsible for removing on the order of 10-20Mt per year on an ongoing basis out to 2100 and beyond.

New Zealand's total level of removals will also depend on the speed of gross emissions reductions, as residual gross long-lived gas emissions will also need to be offset to achieve and maintain net-zero. This is sketched below: a more rapid drop in gross emissions (orange lines) reduces the need for removals to achieve the net-zero domestic target path (light green areas), but a large quantity of removals (dark green areas) is still required in either case as New Zealand's share of drawing down the global overshoot in historical emissions. The total quantity of removals (light + dark green) is higher if gross emissions fall slowly.



For New Zealand, removals will be needed both to offset residual gross long-lived gas emissions (to meet and then maintain net-zero emissions) and also as New Zealand's share of drawing global emissions in excess of the 1.5C carbon budget.

Removals will also be needed:

- to offset nitrous oxide emissions, which are part of the net-zero target
- to offset emissions from international aviation and shipping when these are brought into the net-zero target
- to reduce/displace the need for international cooperation in meeting future Paris Agreement NDCs
- for voluntary offsetting, including the Carbon Neutral Government Programme, and
- to allow for agricultural methane emissions to be offset if customers demand this (which appears to be increasingly the case).
- to respond to international demand for cooperation in CO_2 drawdown from countries that do not have land suitable to reforest or suitable geology for permanent storage.

Together, these suggest that there is very low risk there not being sufficient demand for 10-20Mt of removals per annum on an ongoing basis.

If the government wants an ETS with 1.5C consistency, it therefore needs to adjust the policy framework to both allow for deep reductions of gross long-lived gas emissions and provide stable support for appropriate quantities and types of removals. While our current "net" target does not require this, I believe that an offset-only approach will soon become untenable internationally: we should not lock this in via ETS design, but rather have the ETS set up to enable the likely future expectations.

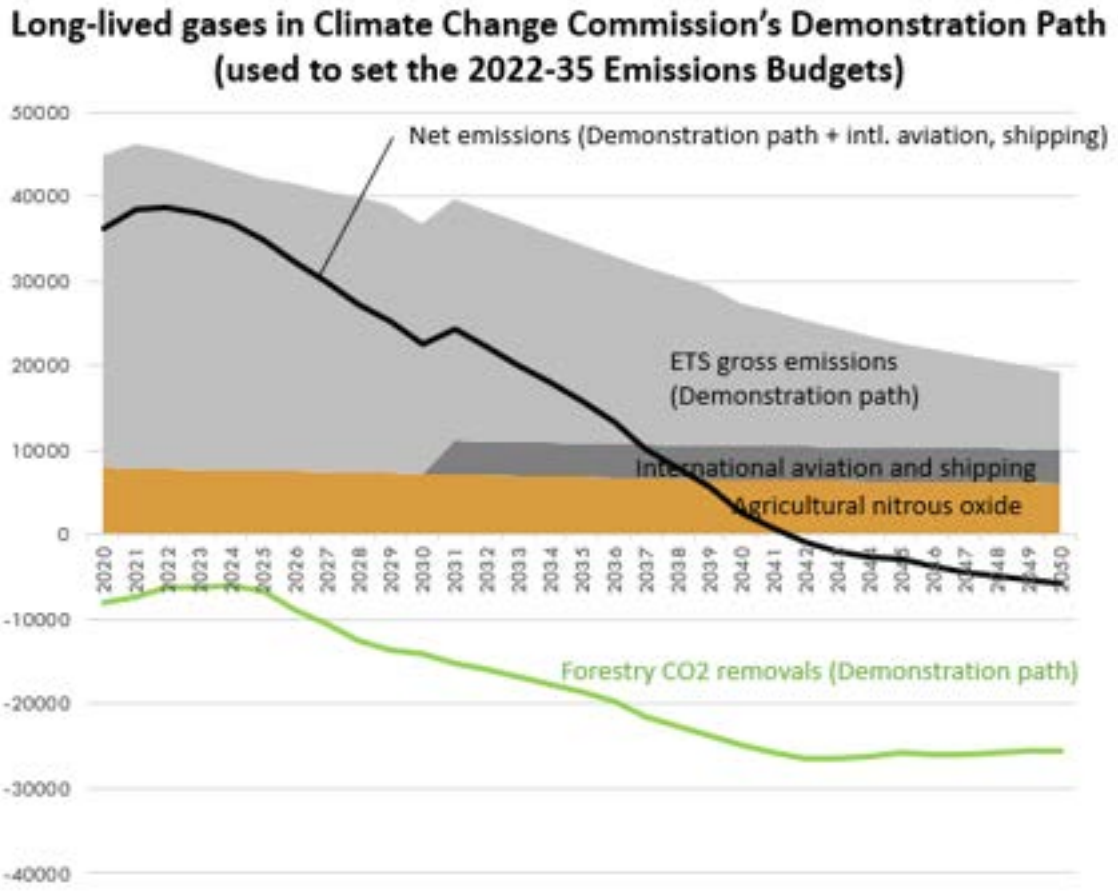
4. **What gross emissions reductions and forestry CO_2 removals are needed to meet current and future domestic targets?**

New Zealand's first three domestic emissions budgets (out to 2035) were set based on the Climate Change Commission's Demonstration Path scenario. This scenario separately models:

- a path for reduction of gross energy/industrial/transport emissions, and the associated emissions price needed to achieve these reductions (which would be high and rising: the newly updated ETS price controls are based on allowing the market to reach such levels if needed)
- a forestry scenario based on supplying sufficient removals not only to reach net-zero in the ETS, but also to be able to cover agricultural nitrous oxide (outside the ETS but part of the net-zero target) and international aviation and shipping when these are brought into the net-zero target.
- agricultural emissions.

The Demonstration Path forestry scenario is not, and was never intended to be, a projection of the level of forestry removals that would occur on a market-driven basis under the ETS alone. The Demonstration Path is not a self-consistent price-driven model of gross reductions and forestry removals: on the contrary, it effectively assumes different treatment of gross ETS-sector reductions and forestry. The levels of forestry removals in the Demonstration Path is similar in scale to previous government projections with ETS prices in the $35 to $50/tonne range, however achieving the Demonstration Path level of gross reductions requires much higher prices. This reflects a value judgement by the Commission, accepted by the government, that gross reductions of long-lived gases are important even though they come at higher short-term cost than forestry removals.

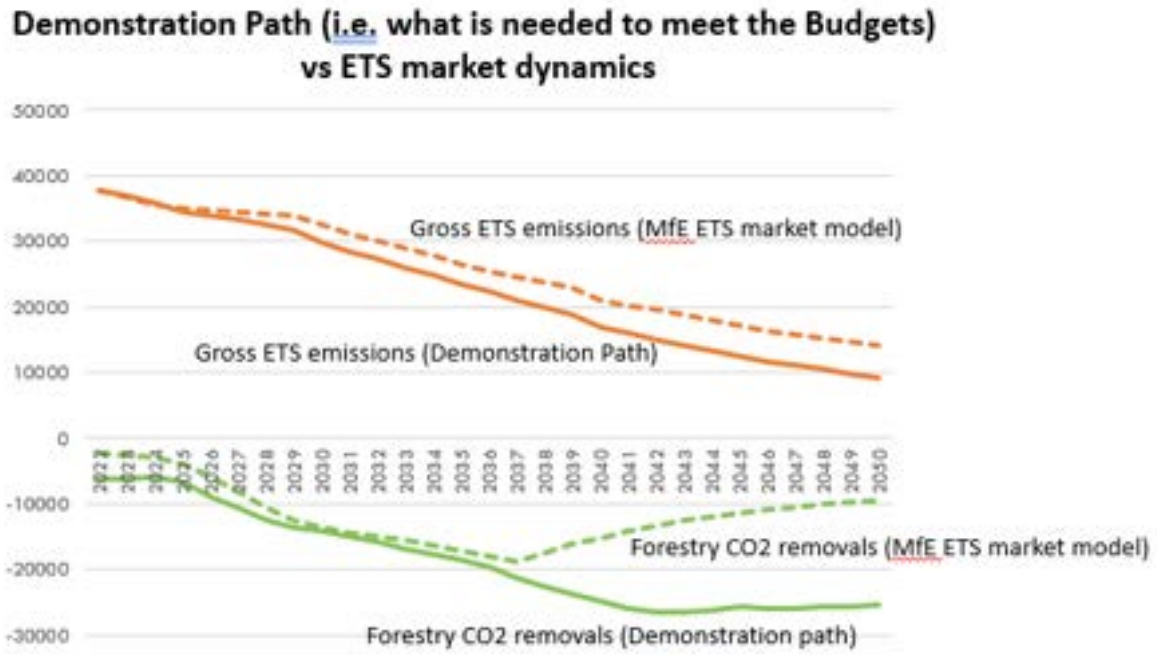
The figure below shows the Demonstration Path for long-lived gas emissions and forestry removals. The amount of forestry removals is by design sufficient to achieve and maintain net-zero for all long-lived gases including ETS emissions (light grey), international aviation and shipping (dark grey, which I have arbitrarily shown entering in 2030) and agricultural nitrous oxide (orange), with a small buffer left over. As such, the “excess” removals in the ETS from the mid-2030s are actually removals that are needed outside the ETS.



5. **<u>What might the status-quo ETS deliver?</u>**

To support the current consultation, the government has released preliminary results from an ETS spreadsheet market model, which balances gross emissions and forestry removals within the ETS, as well as allowing NZUs to move in and out of the very large stockpile of banked units. With perfect foresight of ETS demand, forestry planting (and hence future supply of forestry removals) adjusts downwards over time to match falling ETS emissions. The model is a work in progress, but the initial results show a falling ETS price over time, and

- higher gross emissions than the Demonstration Path (i.e. higher than is consistent with achieving the emissions budgets that have been set), and
- less forestry removals than in the Demonstration Path (i.e. less than is consistent with meeting the emissions budgets that have been set).



Data from MfE file NZ-ETS-Market-Model-Results, Fig 5.6 with SP detail

Putting this another way, achieving the emissions budgets that have been set will require more gross reductions than the status-quo ETS will deliver (because the price won't rise sufficiently high) and more forestry removals (because the ETS won't incentivise removals to offset those emissions that are not in the ETS). There is therefore a significant mismatch between the way the ETS is currently set up and the targets that have been set.

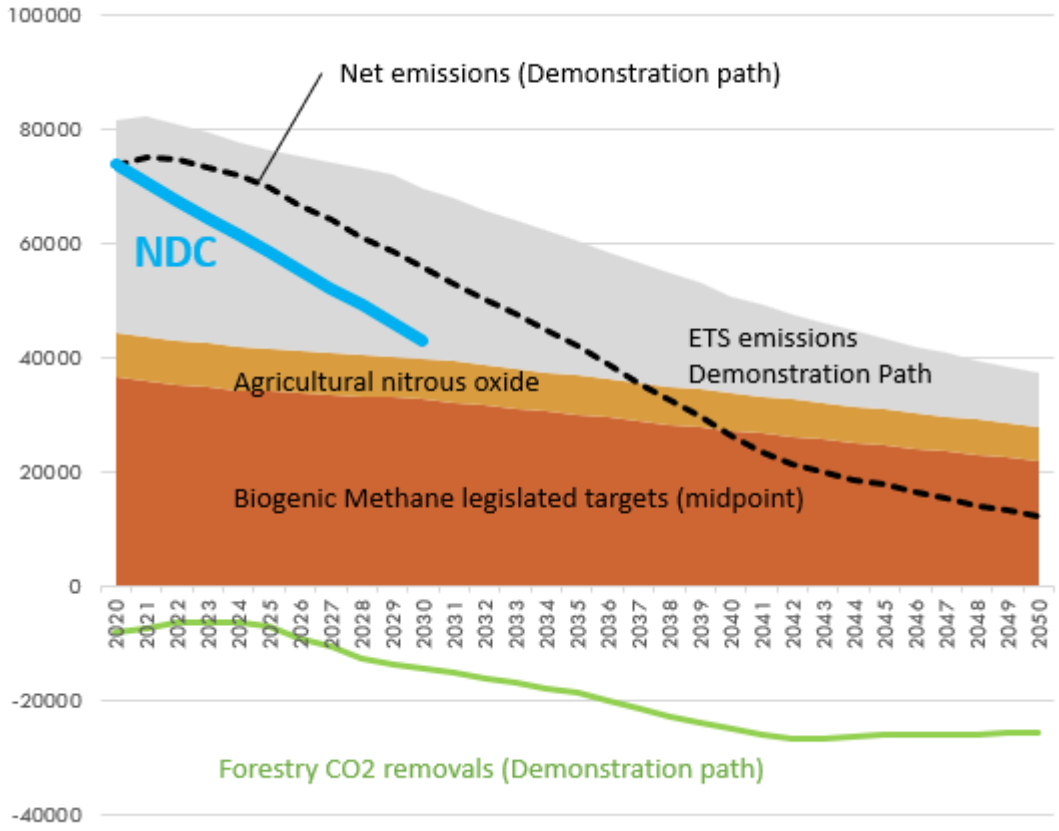
Could the Budgets still be met by the ETS on a "net" basis without any additional focus on gross reductions? At least for the first two budgets to 2030, the answer is no, because any additional forestry planting today would not generate significant quantities of removals until after 2030 (because trees take time to grow). The only way in the short term to close the gap between projected emissions and the emissions budgets is through gross emissions reductions.

6. What is the contribution of gross reductions and forestry removals toward NZ's 2030 Paris Agreement NDC (and future NDCs)?

New Zealand also has an international target under the Paris Agreement which is more ambitious than the domestic budgets. Because the NDC is expressed as an all-gases target (as per UNFCCC expectations) the "net" emissions here are now for all gases. In the graph below I have shown biogenic methane meeting the targets in NZ legislation: a 10% reduction in 2030 and a 24-47% reduction in 2050 (I plot the midpoint of the 2050 range).

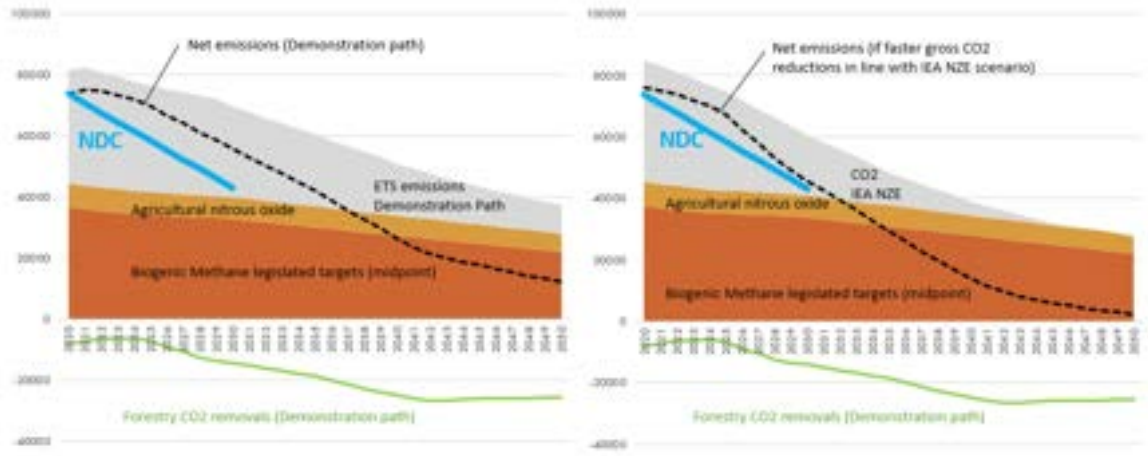
The NDC is shown in blue, and should be compared to the net emissions pathway (dashed black line). To the extent that domestic net emissions are higher than the NDC path, New

Zealand will need to fund an equivalent quantity of emissions reductions in other countries, as allowed for under the Paris Agreement.



Any additional domestic action that can be taken during the NDC period will reduce the quantity of international cooperation required. This could be achieved both through action on fossil fuel emissions (e.g. moving closer to the IEA net-zero energy scenario discussed earlier) and by any over-achievement of the 2030 target for biogenic methane. Conversely, as the domestic budgets and NDC were set on the basis that the 2030 biogenic methane target will be met, any failure to do so results not only in failure to meet the domestic emissions budgets, but an increased need for offshore purchase to meet the NDC.

The figure below shows how New Zealand's net emissions could shift if gross fossil fuel emissions were to drop far more quickly, in line with the IEA NZE scenario (left = demonstration path, right = IEA NZE), and if forestry removals are kept at the level of the Demonstration Path in both cases. The additional gross reductions bend the net emissions curve downward and close much of the gap to the NDC, saving the majority of the need for offshore cooperation. This also means that future NDCs after 2030, as a continuation of the blue curve, could more easily follow domestic emissions without the same reliance on international cooperation.



The critical point here is that <u>even if gross emissions reduce more quickly, that does NOT mean that forestry removals should be scaled back</u>: the freed-up forestry removals contribute to New Zealand's current and future NDCs, directly displacing the need for use of international markets.

Looking out to 2050, this would mean significant net-negative emissions for long-lived gases, however as discussed above, this can be seen as New Zealand's share of draw-down of global overshoot of the carbon budget for 1.5C. It would also provide a source of removals that would be available to offset agricultural emissions as markets demand this. New Zealand's total GHG emissions are, coincidentally, close to net-zero for all GHGs in this scenario.

7. **<u>Consultation options: overall comment</u>**

The consultation document is focused on action within the ETS: asking what is the right balance of gross reductions and removals. Some have argued not to worry because the ETS will self correct by reducing forestry supply (as in the MfE market model), however as discussed above that status-quo outcome is inconsistent with achieving the targets that have been set. The key questions should be

- What is the best way to constrain fossil fuel emissions, providing clear investment signals that drive rapid gross emissions reductions, and
- What is the best way to provide investors in removals (forestry, but also other types of removals) with enough certainty to be able to invest now for what will be uncertain demand in future that will come from multiple sources (residual ETS, international aviation and shipping, agricultural nitrous oxide, NDCs, voluntary market, potentially agricultural methane, international buyers).

My view is that these are separate questions, so the policy framework needs separate levers to address them.

8. Consultation options: specific comments on chapters

CH1&2:

- A lot of this discussion is focused on the current short and medium-term targets. The need for a long-term durable post-2050 carbon sink should be built into the thinking.
- While the "right tree in right place" is important (for wood, biofuels in low carbon economy etc), indigenous reforestation can play a particular role as a long-term durable carbon sink.

Ch3:

- MACCS show the cost of actions, not the carbon price that will deliver them. They show technical potential and do not build in adoption rates etc. As part of the ERP development, officials considered which of the MACC bars are actually expected to be driven on a price-sensitive basis, and answer was that only a minority are.
- The statement that the "existing price corridor indicates range that would support reductions in line with emissions budgets and 2050 target" is simply not true. The Commission's initial modelling showed carbon values at top end of this being required, and its updated and more detailed analysis in 2022 showed that a higher price corridor is needed. The consultation document here seems to be trying to justify Cabinet's poor December decision on ETS settings instead of reflecting expert advice from the Commission (and even from officials).
- For guidance on prices for actual decarbonisation, consider international market prices including current EU ETS price, and for shadow pricing the UK shadow prices used for policy assessment.
- The document says "the review seeks to identify what this preferred pathway is and how to adjust or redesign the NZ ETS design so it can deliver this price pathway." The focus should primarily be on targets/quantities, rather than prices. The primary question should be what is the right *target* for gross emissions reductions.
- I agree that price impacts on households are critical, particularly if ETS prices rise substantially. However these can be deal with through other levers (and/or through increased use of complementary policies such as regulation and subsidy to complement the ETS price).

Ch5:

- The proposed criteria for gross reductions is "more than status quo". This needs to be much stronger: deep cuts in fossil fuel emissions will be needed. The level of ambition in gross reductions could affect ETS design choices, requiring tweaks vs fundamental reform, so clarity on this is critical.
- For forestry, the proposed criteria is "level of removals sufficient to help meet our climate change goals in short to medium and provide a sink for hard-to-abate

emissions in the longer term." This limits the vision for forestry removals to offsetting. Adding a consideration of long-term targets, particularly the likely need to be net-negative after 2050, is critical when considering the role of forestry removals in New Zealand's climate policy mix.

- The document says that "trade offs will be likely" for some options, and the main trade-off will be between the primary assessment criteria. I do not believe these should be traded off: both gross reductions and forestry are needed. Design of the ETS (and other policies necessary to achieve the dual outcomes) should follow the objectives.

Ch6:

Option 1: This is essentially status quo, particularly now that ETS settings have been re-tightened. It is important to keep ETS settings tight, but this does not address the question of gross reductions and forestry removals.

Option 2: This option relies on ongoing large scale purchase from outside the ETS to prop up the price. Both emitters and foresters would be unlikely to have confidence in a future price path if it relies on ongoing ad-hoc government purchase, so this may not provide a stable incentive for investment. Raising the price could stimulate ever-increasing forestry, requiring more buying over time. However elements of Option 2 could be used as an interim step while more durable policy is put in place (e.g. buying out of the ETS in the short term to cover offsetting needs for N2O, international aviation and shipping, and voluntary markets).

Option 3: On its own this would likely result in fewer removals, so would need additional policy outside ETS to support additional forestry in order to meet both the forestry and gross reduction objectives.

a. If there is a restriction on the percentage of forestry units that can be surrendered, there will be a need to provide alternative support for other forestry outside the ETS. This risks having two systems at two different prices for forestry removals.
b. Awarding fewer units (e.g. 1 for 2) appears ad-hoc, would need a clear rationale. The principle of "a tonne is a tonne" is important in carbon markets.
c. Vintaging is not likely to be effective as it leads to arbitrage (swapping expiring units for new ones).

However elements of Option 3 could be used as an interim step while more durable policy is put in place.

Option 4: If done well, has the potential to answer both gross reductions and forestry questions independently. However as the document notes "the degree of investment certainty would depend on the design of and confidence in this new market". Given that the parameters of that future market are not outlined, it is not possible to assess this. While potentially a more ideal long-term outcome, it would take longest to implement and interim steps should be considered.

Across all these options, a critical piece will be the nature of the forestry support system, which isn't outlined here. Such a system must be investible: providing enough confidence that there will be a market in 10-20 years when trees are sequestering. These forestry removals count toward NZ's short, medium and long-term climate targets: they should be supported by government where this is cheaper than offshore purchase.

As an interim step, the government could also consider Commission's suggestion of a price floor (i.e. supplementary carbon tax) for emitters. This would hold the price paid by emitters high, but the ETS market price would likely fall. This could make ongoing government purchase from the market (as in Option 2) more feasible.

Ch7:

The ETS reform options above make it easier or harder to build in incentives for co-benefits. This should be a key consideration in the ETS design: we need to move climate policy beyond carbon-only to an integrated approach, and the ETS should be structured to interface with other support mechanisms. It is not a question of prioritising other issues over carbon removals: if non-carbon benefits were properly remunerated then indigenous forests would be able to compete. As part of this ETS reform we should be seeking a solution that makes indigenous reforestation, particularly on eroding marginal land, a cost-effective investment.

Comvita New Zealand Limited
23 Wilson Road South
Paengaroa
Te Puke 3189

11 August 2023

Ministry for the Environment
Ministry of Business, Innovation and Employment
Ministry for Primary Industries

Dear Sir / Madam

TE AROTAKE MAHERE HOKOHOKO TUKUNGA – REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME

Comvita New Zealand Limited is pleased to be able to make a submission of its views on Te Arotake Mahere Hokohoko Tukunga - Review of the New Zealand Emissions Trading Scheme.

The issues being considered in the consultation are important to Comvita as a successful New Zealand exporting business and one of the largest native forest managers in New Zealand.

Comvita was founded in 1974 and is the global market leader in Mānuka honey and bee consumer goods. As a premium natural health and wellness brand, Comvita is known globally for the quality and efficacy of its natural products, which are backed up by scientific research. We have a team of over 500 people internationally. Our head office is based in Paengaroa, Te Puke, however our team extends across New Zealand and into our overseas markets - Australia, China, North America, South-East Asia, and Europe.

Comvita has invested extensively in science and research programmes, including our own Comvita Mānuka breeding programme (in partnership with Plant and Food Research). Our Mānuka forests footprint is located throughout the southern half of Te Ika-a-Māui, the North Island, and totals approximately 7,500 hectares.

Comvita's purpose is to work in harmony with bees and nature in New Zealand to heal and protect the world. This purpose is central to Comvita's own Harmony Plan (refer https://www.comvita.co.nz/sustainability), which sets out our sustainability focus and how we will make a difference.

Under our Harmony Plan, and in alignment with the requirements of some of our key customers, Comvita has pledged to be carbon neutral by 2025 and to set science-based carbon reduction targets, which we are in the process of having verified by the Science-

Based Targets initiative (SBTi). Comvita has already planted Mānuka and regenerated over 6,000 hectares of marginal farming land, with goals to increase planting in future years. Such planting not only sequesters carbon, but scientific research has also shown the regeneration delivers biodiversity and other positive ecosystem benefits.

Comvita has committed to acting as kaitiaki (guardians) for bees, with a target to save over 100 million bees globally, implemented its own Bee Welfare Code, and committed to investing 1% of its profits in community projects such as Save the Kiwi and Save the Wild. Comvita is a member of the Sustainable Business Council and is in the process of becoming B Corp certified.

The five key points that Comvita would like to highlight in its submission are:

1. There must be an urgent focus on significant carbon emission reductions.
2. We strongly support the creation of a category of quality, internationally recognised carbon credits, based on New Zealand's indigenous forests, which can be used as offsets to emissions.
3. There must be differentiation of, and greater support for indigenous forests to encourage increased planting for the long-term benefit of New Zealand. Mānuka (leptospermum scoparium) as a native creates a far more compelling case for reforestation and carbon capture than pinus radiata in Aotearoa New Zealand.
4. Carbon sequestration and other positive nature benefits should be allowed for as part of the NZ ETS or otherwise.
5. When reviewing the scheme, consideration must be given to supporting other export industries delivering significant benefits to the New Zealand economy and enhancing New Zealand's reputation internationally.

Comvita is happy for this submission to be made public.

Yours faithfully

DocuSigned by:
David Banfield
679406CA1B85438...

David Banfield
Chief Executive Officer
Comvita Limited

Contact: Erin Swanson, Sustainability Lead, [redacted]

COMVITA NEW ZEALAND LIMITED SUBMISSION
TE AROTAKE MAHERE HOKOHOKO TUKUNGA – REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME

REF	QUESTIONS	COMMENTS
2.1	Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?	Comvita believes there needs to be a greater focus on emission reductions. While removals have a part to play in delivering NZ's Nationally Determined Contribution (NDC), these need to be "permanent" removals i.e., more permanent than commercial exotic forestry. Forests that will be harvested and replanted need to be treated differently to permanent forests.
2.2	Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?	Comvita is not a company regulated through the NZ ETS. We, through related entities, have land planted in Mānuka, some of which has been registered under the ETS. To date the NZU price has not impacted our activity in relation to reducing emissions. We do see increasing market and customer expectations globally for climate action and the setting of carbon reduction. We see a real risk that if there is not meaningful action, NZ's performance and reputation in meeting its climate commitments could be questioned.
2.3	Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?	Landowners who we have contact with are partly influenced by NZU prices. However, they also like and appreciate the Mānuka story and the work that Comvita is doing through its Harmony Plan. They see this as more acceptable than what is happening with the planting of pine.
2.4	Do you agree with the summary of the impacts of exotic afforestation? Why/why not?	It is important that the commercial forestry sector is held accountable for any significant negative impacts of exotic afforestation, especially as we experience more extreme weather events with climate change. Balance, and incentivization of the balance of the right species for different areas, to mitigate negative impacts, and maximise the positive impacts, is important for the long-term interests of the environment, local economy and NZ in general.

REF	QUESTIONS	COMMENTS
3.1	Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.	Comvita feels the NZ ETS has a role to play but is only one tool. Other costs, such as losing access to export markets and customers, also need to be considered. We believe it is important for NZ businesses to understand this as we are all an extension of other supply chain networks.
3.2	Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?	It is very hard to accurately predict policy impacts. This will evolve as the climate change consequences intensify. What is clear is that significant carbon reduction is required and quickly. A planned transition will help mitigate some unintended and/or negative consequences and help support a more balanced transition to a low carbon economy.
3.3	How important do you think it is that we maintain incentives for removals? Why?	While significant emission reduction is urgently needed, removals remain an important part of the climate change response and as much as possible must be permanent and maintained in the longer term, especially after 2050. There needs to be greater differentiation between the quality of removals.
4.1	Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?	Comvita supports the application of Te Ao Māori principles and a consideration of Māori interests. Careful balancing of interests is required to meet the best interests of the environment and NZ longer term.
4.2	What other interests do you think are important? What has been missed?	Transition to permanent indigenous forest in marginally productive areas should receive increased support, along with restoration of ecosystems and other biodiversity attributes. Both should be valued in the ETS (or otherwise).
4.3	How should these interests be balanced against one another or prioritised, or both?	Consideration needs to be given to what is in the interests of the environment and NZ as a whole in the longer term, including Te Ao Māori principles as part of this decision-making.
4.4	What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?	Support in devising approaches to balance short-term financial gain with longer term Mātauranga Māori considerations.

REF	QUESTIONS	COMMENTS
5.1	Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?	Comvita believes gross emission reductions must be accelerated. Removals need to be maintained and treated separately.
5.2	Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?	The uptake of low emissions technology should be incentivised provided any perverse impacts in NZ and overseas are understood and acted on. For example, a cross-industry group lobbying for e-utility vehicles with the required functionality for different agricultural activities. Supporting and investing in the development of new technologies and capabilities leading to a reduction of fossil fuel use would be a better outcome than buying removals from overseas to offset emissions in order to achieve required carbon neutral goals.
5.3	Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?	Yes, as the ETS is the government's main tool to reduce emissions. It needs to support NZ's emission reduction commitments and obligations.
5.4	Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.	Comvita generally agrees with the primary assessment criteria, but also supports a consideration of other impacts on nature (e.g., resilience to extreme weather events, improved biodiversity and water quality) as well as a consideration of other positive impacts for business and the economy as a whole.
5.5	Are there any additional criteria or considerations that should be taken into account?	The government needs to educate and provide information to all NZ on what the impact will be if the global temperature increase is not constrained to within 1.5^{o}C. Comvita itself was impacted by Cyclone Gabrielle. What is the likelihood of, and what will be the impact of, even more extreme weather events on the environment, infrastructure and communities. And how do we build an

REF	QUESTIONS	COMMENTS
		environment and society that is more resilient? NZ's society needs to better understand the consequences of not taking action, and also how we can move forward in a positive and structured way.
6.1	Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?	Comvita supports a combination of Options 2 and 4 as outlined in the submission document. **Option 1** We agree that this could encourage increased reduction activity in short to medium term, but the long-term impact is unknown as planting for removals could also increase. There is also no consideration of the other environmental and social impacts of increased or different types of planting. **Option 2** This option would provide NZ companies with an option to buy quality domestic carbon credits which can be used to offset emissions to meet carbon targets, rather than having to go offshore to do so, losing the investment in our local economy. However, if the NZUs are made available to NZ companies or offshore buyers to meet voluntary emissions targets or support voluntary market claims, we believe it is critical that the scheme for creating these removals, governance and registry infrastructure should meet overseas integrity and governance expectations. Further, it is not clear whether overseas markets will accept the concept of cancelling carbon units from NZ that also contribute to NZ's NDC. As suggested the demand could be quite low, thus meaning limited impact. Simply incentivising all removals also gives no consideration of the other environmental and social impacts of increased or different types of planting. **Option 3**

REF	QUESTIONS	COMMENTS
		It is hard to judge the impact of this option without considering the restrictions that will be imposed. It would seem to add a lot of complexity and potentially require a lot of government intervention to achieve the right results, rather than relying on market forces. This could cause issues of inequity for the forestry sector unless the price of removal units is maintained and allowed to grow in line with increasing costs for the sector to operate – this then means that prices for reduction activity have to be even higher to prevent regulated emitters from buying the removal NZUs because they are cheaper than investing in reduction. This option does not support increased removal activity, particularly around creating long-term indigenous forest carbon-sinks. **Option 4** This option gives the ability to drive greater gross emission reduction in a shorter time frame, which is critical. It can also appropriately incentivise removals of different types in different time horizons to achieve impacts required. Differentiation is required between fast-growing exotic species versus slower growing indigenous species which deliver greater long term environmental impacts, and the support each type receives needs to allow for this. It makes sense to align with ETS and other credible ETS systems overseas, considering expectations of the international voluntary carbon market with respect to integrity and transparency, and ensuring they have International Carbon Reduction and Offsetting Accreditation (ICROA).
6.2	Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.	Comvita feels that the options have been assessed reasonably against the key considerations.

REF	QUESTIONS	COMMENTS
6.3	Of the four options proposed, which one do you prefer? Why?	Comvita supports a combination of Options 2 and 4
6.4	Are there any additional options that you believe the review should consider? Why?	If removal NZUs are to be sold into the domestic or overseas voluntary carbon market, the system (registration, assessment, issue of NZUs and availability of monitoring and assessment documents on the NZ Emission Trading Register (NZETR) must be structured to meet overseas integrity and transparency requirements. This has implications for governance of the forestry scheme in the ETS, monitoring and assessment requirements and how the issued units are managed on the NZETR. If these units are made available to the NZ domestic market, they must meet overseas requirements to protect exporters and NZ's reputation in these overseas markets.
6.5	Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?	Comvita would like the government to consider that only permanent forestry removals should be made available to the voluntary carbon market. Further, Comvita believes that only indigenous forests should be allowed in the permanent forests category to best meet the interests of the environment and NZ's long-term interests. Comvita strongly supports the creation of a category of quality, internationally recognised units and that the scheme is recognised by a body such as the International Carbon Reduction and Offsetting Alliance (ICROA) so that overseas markets and customers accept the units earned or used as meeting international best practice. If accepted for registration under the permanent forests category, we would expect that such forests would earn units subject to regular assessment by suitably qualified verifiers.
6.6	Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?	Comvita's view is that Māori are best placed to assess how the different options would impact them.

REF	QUESTIONS	COMMENTS
7.1	Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?	Yes. Comvita believes this reflects a more holistic approach and would make such removals more attractive to the voluntary carbon market and enable them to attract a higher price domestically and overseas.
7.2	If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?	Removal NZUs for permanent forestry should be made available to the domestic and overseas voluntary carbon markets. They should not be able to be used by regulated emitters to use these to meet their ETS obligations. They could still use them for their voluntary carbon claims which are separate from their ETS obligations.
7.3	Should a wider range of removals be included in the NZ ETS? Why/Why not?	Comvita supports including wetland, soil, and other sources of removals, but should only be include in NZ's NDC if the measurement methods meet the standards required for NZ's national inventory reporting.
7.4	What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?	Comvita supports any other initiatives that help communities prepare for and mitigate climate change impacts.

Submitted by: Peter Parsons, Kauri Trees Limited

E: [redacted]

T: [redacted]

REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME

2.1. Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

Yes, for all time periods.

Analytical Constraint: It is not stated if the forecasts are made in 2023 dollars, or adjusted for expected inflation.

With the caveat that all models are wrong, but some models are useful, the following comments are made.

In the short term, NZUs would provide emitters with a suitable offset, but the current cost of emitting is lower than the cost of emission reduction in many sectors. Whilst that remains the case, demand for NZUs will be low, which is reflected in both the price and the volume of NZUs traded. The market is moribund, and fails to attract active interest. A vibrant trading market is required for accurate price discovery.

In the medium term, removers make investments in forests that exceed the normal business planning cycle. A failure to deliver the expected financial returns, coupled with a low NZU price could see existing land left fallow at the end of the growing cycle. If the NZU price declines as forecast, then the cost penalty of harvesting the timber and repaying the NZUs may be comparatively low. This will be even cheaper if the forecasts are in non-inflated adjusted prices.

For confidence that the ETS is going to be a long term mechanism, with a meaningful impact on net carbon output, the incentives must be clear prior to investment in ETS-compliant forestry (especially permanent forests). The proposal to limit the supply of NZUs needs to be combined with a proposal to increase demand – the penalties of emission must be increased in both scope and rate.

2.2. Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

2.3. Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

2.4. Do you agree with the summary of the impacts of exotic afforestation?

No.

Much of the summary of the impacts of exotic afforestation are disappointingly correct, but this is due to the design of the NZ ETS scheme.

Exotic afforestation is identified as being required to meet New Zealand's NDC and domestic emissions targets, but it need not be the case. Indigenous forestry is identified as being more expensive and slower growing than exotic forestry, however:

1. A large amount of investment has been made over decades to improve the rate of growth of exotic forest. Similar investments have not been made in developing faster growing strains of indigenous forestry trees. This review has selectively chosen to consider marginal cost, not average cost in reaching its conclusion.

2. The cost of planting indigenous forestry is identified as being more expensive than exotic forest. No data is presented that shows the marginal cost curve, which is expected to show significantly better economies of scale for exotic trees. Incentives offered for indigenous trees will increase demand, improving economies of scale, leading to a reduction in pricing.

3. Exotic forestry is identified is identified as a potential stabliser for erosion-prone land. Erosion is largely a consequence of the removal of vegetation, predominantly indigenous vegetation. To highlight the benefits of exotic forestry as a saviour of erosion ignores the likely fact that the erosion was caused by the removal of the indigenous flora. If the government seeks to address erosion, do it through a replacement of exotics with indigenous forestry.

Land Change of Use

Land use change (from farming to forestry) has been identified as a challenge. This is overstated. The migration from primary to secondary and tertiary industries will continue (as it has done since the start of the industrial revolution), unless New Zealand farmers were to receive taxpayer funded subsidies not unlike those available in Japan. Transfer payments to farmers is undesirable and leads to distortions in markets and rational decision making.

An acceleration of the restoration of farming land to forestry will deliver dual benefits of a decrease in farming emissions and increase in abatement. It should be seen as a key benefit, not a key challenge. The key challenge is to prohibit the conversion of land to exotic forestry, with its monoculture and its negative impacts on indigenous fauna (eg lack of food sources available in exotic forests).

The risk of fire, wilding and disease caused by exotic forestry remains high in New Zealand. Indigenous trees are already adapted.

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

The NZ ETS is an acceptable mechanism to drive gross emissions reductions. It is certainly preferable attempting to regulate gross emissions at a sector level. The price of the ETS Units remains too low to incentivise emitters to reduce emissions.

The current reduction goals would hardly be described as "stretch goals" and appear to be little more than general efficiency dividends that would occur as part of on-going productivity improvements a business would make in a competitive market. With the current settings, there is little incentive for emitters reduce gross emissions.

Government (taxpayer) subsidies, through the issue of ETS Units to certain emitters has and will lead to a continued oversupply Units, with a consequent downward pressure on price.

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

The cost impact of a higher emissions price is agreed.

It is the role of government to lead, and to institute changes where whole-of-life impact of emissions is not considered by companies, which are primarily focussed on short term financial goals. The banning of non-zero emission vehicles is an example where governments of other countries have led industry to introduce low emission technological change. The cost of the alternative (such as climate change mitigation costs, mass human dislocation and climate induced migration) is certainly higher than the short-term costs associated with prevention.

The New Zealand government may be pleased with itself if emission goals are achieved, but the effect of the current global temperature is already apparent, with severe heat waves in the northern hemisphere in 2023. The disruption to industry, the re-assignment of resources to deal with the current fires, and the losses to whole societies, is already apparent. Meanwhile emitters continue to make special pleadings to protect their sector in the short term.

3.3 How important do you think it is that we maintain incentives for removals? Why?

It is critically important to maintain incentives for increased removals, otherwise no action will be taken by emitters. The exogenous cost of emissions must be internalised to the sector, to the industry, and to the organisation. If it means that dislocation, changes to emission industries, or losses occur, these will be insignificant compared to the cost to broader society, to the country, and to the global population of not doing enough.

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

Maori have a special interest in the NZ ETS review, as do other groups. Maori interest is no more or less important than other groups. The acceptance of special pleading for any interest group, not available to other interested cohorts should be resisted.

4.2 What other interests do you think are important? What has been missed?

The interests of Maori are important, as they are for all New Zealanders. Non-Maori New Zealanders should be considered just as important as other ethnic groups (including Maori). The threat posed by global climate change and the calls for greater ambition by government is not limited to Maori. Using the Treaty of Waitangi as a reason for greater ambition is immaterial when compared to social contract government has with all New Zealanders.

The major global emitters (China and USA) have a significantly larger impact on global warming than New Zealand. Linking global climate change to the Treaty of Waitangi, and

using that link as an argument for public money transfers from all tax payers to a special interest group is a spurious argument that should have no currency.

4.3 How should these interests be balanced against one another or prioritised, or both?

Human activities are driving the imperative to reduce greenhouse gases. The interests to be prioritised should be the impact of global warming caused by human activities. Balancing or prioritising interests of one special interest group is a distraction from the objective: to reduce anthropomorphic activities causing global warming. Government should be prioritising remedial actions to the environment. Once that is done, then consideration can be focussed on special interest groups.

4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

Opportunities for Maori in the NZ ETS review are the same as those for other New Zealanders: the improvement of a mechanism that incentives the achievement of the low-greenhouse gases future. These can be realised by government taking an "environment-first" approach to changes to NZ ETS that drives a change in behaviour by emitters and potential removers.

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

We agree with the Government's primary objective for the NZ ETS review to consider prioritising gross emissions reductions in the NZ ETS.

It is preferrable to reduce emissions at their source, rather than simply offsetting those emissions with increased removals. The root cause of anthropomorphic climate change is the emission of greenhouse gases. Resolving at the source is preferrable to offsetting. If source emissions were reduced, there would be less pressure on generating removals. The effort required to produce removals would then be freed up for productive economic activity, rather than being engaged in offsetting efforts to emitters who had little incentive to reduce greenhouse gas emissions.

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

We agree that the NZ ETS should support more gross emissions reductions through the uptake of low-emissions technologies. The support should consider both incentives and disincentives – incentives to reduce the cost of the introduction of low-emissions technologies (such as accelerated depreciation or subsidies until the technology reaches economies of scale), and disincentives on the use of high-emissions technologies (such as emissions-related taxes and prohibition on the use of certain technologies).

Countries like Norway has shown that the transport sector can transition to non-fossil fuel motor cars. According to the Norwegian Road Federation, in 2022, 79.3% of new cars in Norway were battery electric vehicles (BEVs). The transition started when the range and availability of BEVs was significantly smaller than in 2023. There are no legacy motor vehicle manufacturers in New Zealand, so the transition to BEVs (both new car sales and grey imports) could be achieved immediately, with little economic disruption.

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

New Zealand's climate change goals are inadequate to mitigate the effects of climate change. With global temperatures already at a level that is causing disruption to the status quo and the liveability of the planet, New Zealand, like most countries has shown itself to be too little and too late. Goals are useful, but meaningless goals are useless.

The NZ ETS should be used to support a liveable planet, not just to reach some arbitrary goal set by government.

The NZ ETS should be used to provide a sink for the so-called hard-to-abate emissions. Government should acknowledge that this class of emission largely consists of goods and activities placed in the class by special interest groups, with insufficient incentive to change emission activities. For example, transport claims member of the class, but trains, shipping heavy transport, public transport and farm tractors all have zero-emission solutions available.

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

Additional cost imposed by the NZ ETS on the economy, households, different sectors, and regions should be mitigated though the NZ ETS alone. In this way, the exogenous costs of emissions are internalised and become an endogenous cost to emitters. It should not be expected that all tax payers contribute to the business costs of emitters because those emitters are unwilling to reduce gross emissions.

5.5 Are there any additional criteria or considerations that should be taken into account?

6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

Option 4 (create separate incentives for gross emissions reductions and emissions removals) best aligns with the primary objectives to prioritise gross emissions reductions, while maintaining support for removals outlined in chapter 5.

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

Option 1: Use existing NZ ETS levers to strengthen incentives for net emissions reductions

Option 1 has the following deficiencies.

1. The exemption of forestry from the supply settings in the NZ ETS is a deficiency that has resulted in excess planting of exotic forests. Any exemption should be limited to indigenous forests only, driving planting decisions.

2. Removing the exemption of exotic forests from the regulated supply settlings in the NZ ETS addresses the concerns that the supply of forestry units is projected to more than fully meet emitter demand for units. Maintaining the exemption for indigenous forests has the benefit of incentivising this type of forestry, providing restoration of the ecosystem, including the support for indigenous fauna.

3. The risk that reducing unit supply beyond the levels required by the emissions budgets could lead to firms facing rapidly increased costs without providing enough time for them to transition to low-emissions production is overstated. The matter is not new to firms, and the challenge of how to address global climate change should already be part of the business plans. If firms are "forced" to close, then they are unlikely to be the type of firms that are suitable for the safe future of the planet.

4. The option highlights the risk that higher NZ ETS unit prices could contribute to New Zealand's nationally determined contribution (NDC), but that the increase is not expected to be significant. The focus should be on reducing emissions, not maintaining the NZ ETS price.

Option 2: Create increased demand for removal activities to increase net emissions reductions

Option 2 has the following deficiencies.

1. The option has little to offer over the status quo. Government needs to be more The exemption of forestry from the supply settings in the NZ ETS is a deficiency that has resulted in excess planting of exotic forests. Any exemption should be limited to indigenous forests only, driving planting decisions.

2. The "…consultation assumes that the Government will not wish to units offshore if that means they cannot be used to meet Aotearoa New Zealand's NDCs because of its commitment to meet NDCs through domestic action as far as possible.

"Selling units that cannot then be used towards Aotearoa New Zealand's NDCs would add further challenges to the ambitious targets that already exist."

This parochial assumption ought be jettisoned. Climate change is a global problem. Nation states need to adopt a global solution. If national pride limits the reduction on greenhouse gases, then the result for all humans will be bleak. If NZ ETS units are retained in New Zealand, and if that means that New Zealand achieves its nationally determined contribution (NDC), that does not mean that global temperature rises will not impact on New Zealand's climate.

3. An expected increase in the cost of emissions does not necessarily lead to increase cost for consumers. The assumption ignores the effect of increased competition from suppliers that have reduced emissions, and the substitution effect as consumers move from higher priced goods and services.

There is no reason for taxpayers to support failing industries. A similar argument was used to protect horse breeders, farriers and saddle makers when the automobile was introduced. Government should not allow itself to be captured by incumbent industries.

Option 3: Strengthen incentives for gross emissions reductions by changing the incentives for removals

Option 3 has some attractive features, such as the ability to incentivise indigenous forestry over exotic forestry, particularly the allocation of fewer units per tonne for exotic forests. However it also has the following deficiency: "This option will adversely affect Māori forest owners or those who own land that is suitable for afforestation." (p64).

There is no difference between Maori forest owners and other owners. Are not all owners equal? If low income groups are negatively impacted by increased prices, then transfers can be made to all those within the class, irrespective of race.

The adverse impact only occurs if it applies to all forests. Indigenous forests should be exempt, delivering the dual benefits of carbon removal and an increase in indigenous forests.

Option 4: Create separate incentives for gross emissions reductions and emissions removals

Option 4 has the most attractive features, with the following deficiency related to the question posed: "…who would purchase removals units." (p65).

There is no proposal regarding how the price for the "fixed price purchase option" (p66) would be established and modified. This should be detailed if this option is to be evaluated.

6.3 Of the four options proposed, which one do you prefer? Why?

Option 4 (Create separate incentives for gross emissions reductions and emissions removals) is the preferred option. It has more attractive feature and fewer deficiencies than any other option.

Option 4 has the greatest positive impact on both the reduction of gross emissions, and support for removals. Given the deficiencies identified in the document with the existing ETS, adjustments at the margins of the scheme is less likely to deliver the changes required.

6.4 Are there any additional options that you believe the review should consider? Why?

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

We generally agree with how different options might impact Maori, and equally impact all New Zealanders. It is somewhat misleading to allocate Maori to a single group. If one of the

objectives is to compensate people in a strata within society, then limiting the question to one race further marginalises other races within the same stratum. A significant proportion of Maori are not amongst the nation's poor or disadvantaged. The ETS should not be used to address any social welfare policy issues identified by government.

7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

Incentives in the NZ ETS should prioritise removals with environmental co-benefits such as indigenous afforestation.

If the primary removals activity is afforestation, then prioritising indigenous afforestation is going to be a better option than exotic afforestation because it:

1. Restores the environment to its pre-human habitation status.

2. Supports indigenous fauna.

3. Reduces the risk of introduced disease that may be endemic in exotic flora.

4. Provides better support for indigenous polyculture.

5. Provides an afforestation solution that is already adapted to New Zealand's climate and range of flora diseases.

6. Less risk that there will be negative impacts on waterways quality and compatibility with other indigenous flora and fauna.

7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

If the NZ ETS is used to support wider co-benefits, the options outlined in chapter 6 that would provide the greatest opportunity to achieve co-benefits is Option 4 (Create separate incentives for gross emissions reductions and emissions removals).

Although Option 4 is the most complex change to the NZ ETS, complex change is required if co-benefits (such as better support for indigenous flora) are to be achieved.

7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?

A wider range of removals (eg carbon capture and storage) is not required in the NZ ETS as this stage. If Option 4 (Create separate incentives for gross emissions reductions and emissions removals) is adopted, then the complexity of the changes will be sufficient to introduce for the current review. Further removals options may be considered as part of a subsequent review, within a new Option 4 structure.

7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals?

Where co-benefits are achieved by removals, then no additional rewarding is required. An additional reward (for say the increase in the prevalence of indigenous fauna) will require verification, adding to the complexity. The co-benefits should be considered as a positive

externality, while the focus of the NZ ETS remains on the reduction of gross and net emissions.

Other sources of removals (eg carbon capture and storage) are unproven, but could be considered in a subsequent review. No additional rewarding is required as part of this review.

A REDESIGNED NZ ETS PERMANENT FOREST CATEGORY

We want the redesigned permament forest category to achieve multiple outcomes

Question 1: How do you think the Inquiry's recommendations could be reflected in proposals to redesign the permanent forest category?

The Inquiry's recommendations should propose that the permanent forest category should be limited to indigenous trees that grow to a height of at least 10 m. This will promote the planting of significant trees in preference to lower height bush. The reason for requiring taller trees is to ensure that a greater amount of carbon is sequestered per hectare of land under afforestation.

Question 2: Do you agree with our assessment criteria for the redesigned permanent forest category? If not, what would you change and why?

We support the first three assessment criteria listed in the discussion document.

Assessment criterium 4 (Support Maori aspirations for their land) is not required as an assessment criteria for permanent forests for two reasons.

a) Rather than limiting the assessment criterium to Maori, the criterium should be broadened to include interest of all New Zealanders and their "ability to make decisions regarding their land in line with their cultural, social, environmental, and economic aspirations"; and

b) Even if (Māori) land is marginal and difficult to access, it is largely irrelevant for permanent forests because they are permanent, with the ability to plant indigenous species adapted to the status of land (marginal or not), and little need for regular access.

Assessment criterium 5 (Support for rural economies and communities) appears to ignore that change happens (such as the increased population movement from rural to urban), and protecting the status quo locks New Zealand into the existing paradigm, which has led to anthropomorphic climate change. It is problems with the status quo that has resulted in the current climate emergency.

Question 3: Do you think any of these criteria are more important than the others? If so, which criteria and why?

The order of priority for the assessment criteria should be 1, 3, 2, 5, 4.

The removal of greenhouse gases (GHG) from the atmosphere is most important because even the current GHG levels are resulting in climate changes that is making current living conditions untenable in some parts of the world. If GHGs are not removed from the atmosphere, and climate change halted, then the other criteria become moot.

Criterium 3 (provide positive environmental outcomes) is desirable and achievable if permanent forests are indigenous. They fit effortlessly with indigenous fauna and provide the restoration of the ecosystem that both flora and fauna are well adapted to prior to human intervention.

Design Choice 1: Which forests should be allowed into the permanent forest category?

Question 4: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? (Note, options 1.2a and 1.2b are not mutually exclusive)

Option 1.1 is by far preferred (transition and indigenous forests only in the permanent forest category). It is an anathema that land owners should ever receive taxpayer-funded transfer payments for other than indigenous afforestation.

Problems with Option 1.2

If land owners want to plant exotic permanent forests, they should not be a part of a taxpayer-funded program.

Government should reject the special pleading by interest groups. It always leads to increased complications and costs, that are borne by other participants and funders (taxpayers) of the concession. A myriad of exemptions increases the regulatory burden and compliance costs (including enforcement).

The suggestion that exotics are suitable for the soil stability, protection of waterways, and biodiversity ignore the fact that there are already adapted indigenous trees that can achieve the same or superior results.

The biodiversity that would occur by the creation of exotic permanent forests is neither required nor desirable. Any imported species will increase the diversity by definition. However, the use of indigenous trees for permanent forests can create a biodiverse environment that is already adapted to New Zealand.

If growers want to change the eco-system through the planting of permanent exotic forests, they should do it in the regions where the exotics are indigenous. They should certainly not be supported by New Zealand taxpayers.

Option 1.2b should be rejected. Maori should not be given a concession to destroy the indigenous ecosystem through the introduction of exotic permanent forests. As the oldest migrant group in New Zealand, Maori should respect and support the indigenous ecosystem, in preference to any taxpayer-funded income that may be derived from exotic afforestation.

If any group wants to plant permanent exotic forests, they can do it outside the NZ ETS.

Question 5: If you support allowing exotic species under limited circumstances, how do you think your preferred 'limited circumstance' should be defined? (for example, if you support allowing long-lived exotics to register, how do you think we should define 'long-lived'?)

We do not support exotic species in the permanent forest category in any way. There are many long-lived indigenous species suitable for permanent forests, including Rimu, Kauri, Puriri, Totara, and Pohutukawa, all of which can exceed 1,000 years life expectancy.

Permanent forests could support environmental benefits and climate change adaptation and resilience (afforesting erosion-prone land)

Question 6: Do you think there is an opportunity to use permanent forests to stabilise erosion-prone land?

There is an opportunity to use permanent forests to stabilise erosion-prone land. The ecosystem was relatively stable prior to the arrival of humans in New Zealand, when forests were permanent and erosion contained.

Depending on the type and extent of the erosion, it may be necessary to plant the permanent forest over stages, with nurse plants used to stabilise the erosion, then permanent forest trees used to restore the damaged land. Whilst the nurse plants should not be classified as permanent forest trees, the planting program administrator should plan for the transition to permanent forest trees.

Permanent forests could help address the risk of wilding pines

Question 7: Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?

The government should not consider exotic species in the permanent forest category, whether they have a low wilding risk or not. Numerous examples exist where the introduction and use of introduced flora and fauna, which were designed to perform a specific function, resulted in unintended consequences. Where indigenous trees are available for permanent forests, the is no compelling reason to permit exotic species in permanent forests (irrespective of the wilding potential).

Exotic flora and fauna will always change the ecosystem balance. New Zealand has a zero-risk approach to biosecurity at the border. That approach should be applied to exotic species and permanent forests.

It is a core function of flora to spread its seed. Wilding will occur. A more prudent approach is to not allow exotic permanent forests in the NZ ETS.

Design Choice 2: How should transition forests be managed to ensure they transition and reduce the financial risks to participants?

Question 8: Do you agree with the proposal for a specific carbon accounting method for transition forests? If you disagree could you please provide the reasons why? If there are other options you think we should consider please list them.

A specific carbon accounting method for transition forests is not required.

The statement that indigenous species sequestrate less carbon that exotic forest is not necessarily the case where suitable indigenous species are selected for the environment and growing conditions.

If 5% of the exotically afforested area was transitioned to indigenous forests each year, then the financial impact is minimal. In any event, growers that have planted exotics as permanent forests have made a decision that is sub-optimal for the environment.

Question 9: If you agree with the proposal for a specific carbon accounting method for transition forests, what do you think it needs to achieve?

A specific carbon accounting method for transition forests is not agreed.

Question 10: What do you think should occur if a forest does not transition from a predominately exotic to indigenous forest within 50 years?

Note: we are not seeking feedback on the details of the specific accounting values now – if Option 2 is chosen, we will consult on the design of the regulations at a later date.

If a forest does not transition from predominantly exotic to indigenous forest within the required time, then it should be removed from the NZ ETS and should no longer receive any financial support from taxpayers.

In any event, 50 years is too long for the transition. 20 years should be the maximum time. 10 years is preferrable.

Design Choice 3: How should permanent forests be managed?

Question 11: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? (Note, options 3.2 and 3.3 are not mutually exclusive)

The status quo (Option 3.1) is satisfactory for existing indigenous permanent forests.

Option 3.2 is required for exotic forests to ensure there are no negative externalities (as impossible as that may be with exotic forests in New Zealand).

Option 3.3 is the preferred forests management option for transition forests.

Question 12: If there were to be additional management requirements for transition forests, what do you think they should be for? Why?

A more intensive management regime is required for transition forests because of the likelihood of compliance failures. Regulators should contemplate that growers of exotic forests are unlikely to transition if there was not a comprehensive compliance monitoring program in place. Significant financial penalties to both corporations and individuals are required to ensure that only compliant forest receive taxpayer money.

Question 13: Do you think transition forests should be required to meet specific timebound milestones to demonstrate they are on a pathway to successful transition?

Transition forest should be required to meet specific timebound milestone to transition to indigenous forests. Transitions should be completed within 20 years.

Without the establishment and completion of transitioning to indigenous forests, growers should not receive taxpayer money for a failure to transition.

Question 14: Do you agree with this proposal to allow transition forests to be permitted to clear-fell small coupes or strips to establish indigenous species? Why? And if you agree, what other restrictions should there be?

The proposal to allow transition forests to clear fell small coupes or strips to establish indigenous forests is agreed.

Clear felling areas is a satisfactory way to ensure that 100% of exotic trees are removed and replaced with indigenous trees.

Transitioning of a minimum of 5% per annum should be required to stay enrolled in the NZ ETS and benefit from taxpayer payments.

Design Choice 3b: How flexible or prescriptive should forest management requirements be?

Question 15: If forest management requirements are implemented, do you think these should be prescriptive or outcomes focussed? Why/Why not?

Prescriptive forest management requirements are preferrable to bespoke requirements. Prescriptive requirements provide regulatory certainty to all participants in the NZ ETS.

Bespoke requirements will likely start rounds of special pleading, where participants with more resources mount arguments for receiving concessions. This will undermine the integrity of the NZ ETS, with smaller participants less likely to receive the concessions.

A bespoke regulatory regime will likely be more administratively expensive for taxpayers to fund. The bespoke requirements will only benefits those making the special pleading.

One way to implement forest management requirements could be via forest management plans

Question 16: What are your views on forest management plans?

If permanent forests are limited to indigenous forests, they are permanent. There should be no need for a forest management plan. Forest management plans should only be required for transition forests (or exotic forests if they remain permitted).

Question 17: What should forest management plans include?

Forest management plans should include the transition program, identifying the areas of the forest that will be replanted in indigenous species. The plan should also cover compliance verification requirements.

Question 18: Who do you think should be allowed to verify forest management plans?

Forest management plans should be verified by independent assessors.

Question 19: How often do you think forest management plans should be audited or re-verified?

Auditing for the compliance with the plan should be undertaken every two years. Participants in the NZ ETS who are receiving taxpayer-funded money should not be

permitted to use the same auditor for contiguous audits, and no more frequently than twice every five years.

Question 20: What do you think should happen if there are not enough people to verify forest management plans?

If forest management plans are limited to transition permanent forests, then the verification resources should be sufficient. If there are not enough people to verify forest management plans, the verification price should adjust up to clear the market.

Design choice 3c: What should the compliance (monitoring and enforcement) regime look like?

Question 21: Do you think the use of existing compliance tools are appropriate?

The use of existing compliance tools are appropriate.

Question 22: Do you think there should be new or expanded compliance tools for permanent forests? Which ones and why?

New compliance tools are only required for transition permanent forests.

Failure of compliance should be penalised by cancelling taxpayer-funded NZ ETS units for the period of non-compliance.

Question 23: Are there other compliance options that you think we should consider?

There are no other compliance options that need to be considered.

Question 24: For the compliance tools you think we should have, when do you think they should be used?

Any compliance tools should address transition forests.

NZ ETS Consultation
Ministry for the Environment and
Ministry for Primary Industries

10 August 2023

Greater Wellington Regional Council's responses to the NZ ETS review consultations

To Whom It May Concern,

Thank you for the opportunity to submit our views on these important consultations concerning the status of permanent forests in the Emissions Trading Scheme (NZ ETS). Our responses to the individual consultation questions are included with this letter. A summary of these follows.

Concerning the primary NZ ETS review being led by MfE, Greater Wellington (GW) thinks option 4, (that would separate emissions trading for forestry entirely from that for gross emissions) best aligns with the primary objectives to prioritise emissions reductions while maintaining support for removals. However, we support **option 3** because this option requires a degree of change to the NZ ETS's architecture that is lower than option 4 and so would be faster to implement. It is a compromise, but an extended period of uncertainty regarding ETS settings would be harmful to making progress with meeting national emissions budgets and targets.

GW recognises that **additional policies are needed** to manage potential impacts of the NZ ETS review with respect to forests. We have highlighted the fact that GW is a landowner and has interests in the NZ ETS. GW encourages the government to 'grandparent' the rules for any permanent forests that have been registered in the

ETS or PFSI and any NZUs that have already been issued for forests. To do otherwise would have a direct negative impact on council's asset values and consequently its decarbonisation programme.

GW encourages the government to uphold its **Te Tiriti obligations** and meaningfully engage with Māori to carefully manage potential impacts of the NZ ETS review on the short, medium and long-term.

Finally, GW thinks that the incentives in the NZ ETS should be changed to prioritise removals with **environmental co-benefits**. GW recognises that exotic forests have a role to play in many circumstances but also recognises that native forests offer a better long-term solution to carbon sequestration and provide a range of associated ecosystem and cultural benefits.

Concerning the redesign of the permanent forest category of the NZ ETS being led by MPI, GW supports the **option 1.2: exotic forests allowed to enter under limited circumstances**. We think that targeted exotic species exceptions that will accelerate the **reduction of erosion risk** should be included in the permanent forest category. Exceptions could include a range of exotic species (e.g. Eucalyptus, Douglas Fir, Redwood, etc.) that have **beneficial, long-term use** in some catchments, as well as significant **carbon storage** potential.

GW supports the **option 2.2: enable new mandatory specific carbon accounting methods for transition forests in the new permanent forest category**. This option prevents a possibly significant surrender liability where the forest owner must give back most of the emissions units they had been issued when the exotic forest was growing.

However, GW has concerns regarding relying on the ETS to establish transition forests and indigenous forests, since they would have a comparatively poor return on investment and complex long-term management responsibilities. We also have concerns regarding who can be held responsible in case of a failed transition or if no attempt to execute a transition is made by the forest owner. Therefore, GW thinks it is unavoidable that if the **government** wants to see indigenous forest be restored on a large scale it **should be directly involved** from the outset, rather than relying on a market mechanism like the NZ ETS to motivate the private sector to deliver this outcome.

GW finds it difficult to identify what the best approach might be to managing compliance with rules for permanent forests, given that the National Environmental Standard for Plantation Forests (NES-PF) changes are still unknown. GW's perspective is that it may be more manageable to monitor and keep track of permanent forests if they automatically **fall under a revised and strengthened NES-PF,** due to the existing internal systems and processes that are already established.

GW agrees with the proposal to allow transition forests to be permitted to clear-fell small coupes or strips to establish indigenous species only if there were **specific restrictions to stop entire catchments being cleared at once**.

If forests management requirements are implemented, GW is supportive of having **outcomes-focused requirements**. Those requirements should be **flexible** enough to allow forest managers to adapt to various circumstances.

GW thinks that forest management plans need to be **reviewed by experts** and should provide a **general overview of the activity** as well as being more specific, especially regarding **mitigation measures**. GW supports that the **local authority should be able to monitor implementation of forest management plans and enforce compliance with rules, provided they are appropriately resourced**.

We trust you will take our input into consideration.

Ngā mihi,

Councillor Penny Gaylor
Chair, GW Environment Committee

Te Arotake Mahere Hokohoko Tukunga
Review of the New Zealand Emissions Trading Scheme

Submitter details

1. Submitter name
Craigmore Sustainables NZ Ltd

Craigmore Sustainables (Craigmore) is a unique Kiwi-owned and operated company that manages more than 25,000 hectares of dairy, grazing, forestry and horticultural properties (60 in total) throughout New Zealand. The company manages over $1 billion of assets and employs more than 230 people.

2. What is your contact email address?
[redacted]

3. Are you submitting as an individual or on behalf of an organisation?
Organisation

4. Which region are you in?
Not applicable - national organisation

5. Please choose any you are associated with:
- Academic/research institute/subject matter expert
- Iwi/Hapū/ Māori
- Local government
- Business
- **Forestry**
- **Farming**
- Farm forestry
- Industry body
- Environmental group
- Registered charity
- Community organisation
- Individual
- Other
- Not applicable
- Other: Horticulture

Chapter 2: Expected impact of current NZ ETS

2.1. Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

Unsure

We agree that a ***functioning*** ETS should drive gross emissions reductions. However, the work understates the impact of continual policy changes on the willingness for investors to commit to long-terms investments in both reduction and removal of GHGs. Such indecision and volatile policy settings dramatically increase the discount rate for climate-positive investments. A strong and ***stable*** price to incentivise forestry removals gives the best investor confidence for stable ongoing levels of afforestation. NZ will still need a significant volume of forestry removals to achieve emissions budgets and Nationally Determined Contributions under the Paris Agreement.

Modelling:

- There has been industry concern raised in ETS review webinars and sector submissions (NZFOA, NZIF) about the modelling assumptions used.
- It was noted in the MFE summary of the modelling report and webinar that in the forecast afforestation rate that land costs have been fixed based on the Manley (2021) work – which is a fundamental flaw. Craigmore's experience is that land prices (for ETS eligible land) are explicitly linked to NZU price and should not be a fixed input to any ETS modelling on expected afforestation rates.
- The projection of future afforestation rates appears too high when considering the indicated policy direction of OIO, Ministerial Inquiry into land use, NES-PF and RMA reform. As well as stated intentions of our two main political parties to restrict afforestation if elected.

2.2. Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

No

2.3. Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

Craigmore's participation in the market to date is far less affected by NZU price than changes to the OIO rules and other pending policy change such as the Ministerial Inquiry into land use, NES-PF and RMA reform. As well as stated intentions of our two main political parties to restrict afforestation if elected.

High NZU prices are reflected in land price expectations quickly, so modelled financial returns remain at a similar level. Land prices have been far stickier to reduce with the recent decline in NZU prices.
More relevant to land use change, is not the absolute price of NZUs, but the relative price of NZUs to the underlying farm-based value. If the NZU price for forestry removals falls below the value based on farming use, then there will be very little new planting.

A negative aspect of the correlation between land value and NZU price is that the ETS unfairly rewards owners of marginal hill country farmland. As the NZU price rises the cost of land increases, so that the costs of mitigation increases. The forestry investment discount rate stays constant, resulting in the landowner obtaining a large economic gain at the expense of the NZ taxpayer (who pays for higher mitigation costs through the OIO). This raises material social equity concerns.
The volatility in policy settings for the ETS (e.g. consulting on an option that removes forestry from the ETS completely) is massively damaging to investor confidence. This could come at a massive cost to the NZ taxpayer in meeting NZ's 2030 Paris Accord commitment.

2.4. Do you agree with the summary of the impacts of exotic afforestation?

No

Land use change:

- Under the header land use change the impacts of exotic afforestation are all impacts attributable to permanent forestry – which is a negligent oversight.
- The consultation has not acknowledged the benefits of afforestation for production forestry (timber production over multiple rotations, with carbon benefits).
- The positive impacts of land use change for production forestry are far greater than either sheep and beef or permanent forestry.
- Production forests provides employment and opportunities for domestic processing and export earnings. There are options for changing tree species after harvest to suit economic and environmental aspects.
- The 2020 PwC report found that, on average, forestry generated greater economic benefit than sheep and beef farming, with double the "value chain impacts" and almost double the FTEs per hectare.
  https://www.nzfoa.org.nz/resources/file-libraries-resources/discussion-papers/848-economic-impacts-of-forestry-pwc-report/file
- Craigmore has reviewed the PwC report and considers that afforestation on hill country farmland within 100km of transport hubs or hills, generally has greater economic benefit to Aotearoa NZ than hill country with a stocking rate of 8 stock units per hectare.
- Craigmore does not manage permanent forestry assets. Our forestry assets are managed for timber (over multiple rotations), with carbon benefits. Under OIO rules the only entities in the market that can participate in (managed or unmanaged) permanent forestry are New Zealanders.
- The land use change from farming to exotic trees results in CO_2 sequestration but also the reduction in emissions from the action of removing stock from the land.
- Briefly mentioned are the environmental outcomes of stabilising erosion prone land, but environmental benefits should also include outcomes such as water quality, soil quality and biodiversity, when compared to a hill country farming operation.

Land-use flexibility:

- Once land is forested it must remain forested.
- Craigmore participates in the market acquiring marginal sheep and beef country for afforestation.
- Properties may have erosion issues, or reversion issues. They are not highly productive farms.
- The sort of land that most afforestation is occuring on does not have a sensible future back into farming, therefore land-use flexibility is not relevant.
- But if land use change to a land use other than forestry is desired in the future, there is scope within the existing structure of the ETS to deforest and plant an offset forest elsewhere.

Permanence:

- As forests that are managed for timber, with carbon benefits, the forests Craigmore develop and manage are protected for permanence, e.g. fire management, pest control.
- Craigmore supports "right tree right place", and this is evidenced in our application of super wide riparian margins of native species and road buffer planting in mānuka (property specific).

Chapter 3: Driving gross emissions reductions through the NZ ETS

3.1. Do you agree with the case for driving gross emissions reductions through the NZ ETS?

Yes

The ETS should be one instrument to support reduction **and** removal of GHG emissions, as BOTH are required to achieve the ultimate goal which is net zero GHG emissions; or even net GHG decline in the long term, should we surpass our GHG planetary boundary.

3.2. Do you agree with our assessment of the cost impacts of a higher emissions price?

Unsure

3.3. How important do you think it is that we maintain incentives for removals?

Crucial – Net Zero GHG is the goal which requires removals and reductions. Both are important tools in the toolbox in achieving the goal. Just because ALL forestry removals are not permanent, does not mean that they do not have a strong role in the next 20 years in order to buy time for more difficult reductions e.g. decarbonation of the transport sector, methane inhibitors for livestock. A strong and stable price to incentivise forestry removals occurring sooner rather than later gives the best investor confidence for stable ongoing levels of afforestation.

Chapter 4: Changes to the NZ ETS would be significant for Māori

4.1. Do you agree with the description of the different interests Māori have in the NZ ETS review?

Unsure

4.2. What other interests do you think are important? What has been missed?
No comment

4.3. How should these interests be balanced against one another or prioritised, or both?
No comment

4.4. What opportunities for Māori do you see in the NZ ETS review?
No comment

Chapter 5: Objectives and assessment criteria

5.1. Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals?

Agree

Craigmore is encouraged by the repeated emphasis throughout the consultation document, webinars and Minster Shaw's Herald column that the ETS review seeks to incentivise BOTH emissions reductions AND forestry removals. Forestry removals provide the best immediate tool to reduce net emissions and NZ's NDC 2030 liability, and they provide a long-term solution to removal through the embedded carbon in harvested wood products.

5.2. Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow?

Agree

5.3. Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term?

Agree

Failure to incentivise removals will create a huge hole in our GHG budget over the next 15-20 years, and larger Paris Accord liabilities.

5.4. Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation?

Agree

Are there any you consider more important and why?

Craigmore agrees in principle with the analysis that NZ requires a scheme that incentivises removals and reductions in GHGs, and that it cannot rely solely on removals. We see the primary assessment criteria as of equal importance because the goal is NET zero.

5.5. Are there any additional criteria or considerations that should be taken into account?

- Ecological benefits of afforestation for production forestry and permanent native plantings.
- Economic benefits of production forestry.
- Social equity – on current settings, owners of marginal land will obtain massive land valuation gains if the carbon price rises to a level that is required to encourage material decarbonation e.g. $150/NZU. This lift in land value (e.g. from $10,000/ha to $30,000/ha) dramatically increases the cost of forestry removals from say $50/NZU (example price required to shift from marginal farmland to forestry) to $150/NZU. This causes material social equity concerns, in that the lift of $20,000/ha in land value is paid by NZ consumers of power, food, and fuel.

Chapter 6: Options identification and analysis

6.1. Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

Option 1
Option 2
Option 3
Option 4

With the lack of policy design, implementation detail and modelling it is difficult to give an opinion with certainty which of the four options will best meet the primary assessment criteria.

6.2. Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5?

Unsure

Please explain your answer here and provide any evidence you have.
With the lack of policy design, implementation detail and modelling, there is insufficient information to assess the options in respect to the key considerations.

6.3. Of the four options proposed, which one do you prefer?

Option 1
Option 2
Option 3
Option 4

With the lack of detail on how each of the options will be implemented in policy it's impossible to state with certainty which of the options Craigmore prefers.

The problems of land-use change and ensuring a fully functioning ETS requires more than just changes to the ETS, and more than just one of the 4 options. The most likely solution is a mix of the options and changes to planning rules regarding land-use change. Further, the consultation document is not sufficiently detailed on these options – as the devil is in the detail. All that is possible is to comment on general direction.

Craigmore believes a mix of all options could be viable. Consultation documentation and webinars reiterated that the options do not need to be mutually exclusive.

Craigmore believes the likely best solution is a systems approach that may take a mix of options, adding changes to planning rules (NES for permanent and plantation forestry), overseas investment rules and government investment to support transition of rural communities.

What is immediately needed is a clear policy statement to give certainty to investors to avoid 2-3 year deferment of investment decisions e.g. announcing a floor price for removals under any of the options.

There are elements of each option presented that Craigmore supports:

Option 1

- Possibilities under this option can be implemented quickly and may provide options for transition as policy is developed and consulted.
- E.g. Reduce number of units available at auction to encourage use of forestry removals units which are at least underpinned by actual CO_2 sequestration.
- E.g. Cease industrial allocation, companies have had sufficient years of government subsidies.
- E.g. Price controls – continue to adopt Climate Change Commission recommendations in full.

Option 2

- Opening sale of NZUs to non-NZ purchases may have merit and reduce the large inventory of NZUs currently on offer – if a buyer can be found - but it will not address the core socio-political issue with the ETS.
- The cost to the government of purchasing NZUs at market price is likely to be unacceptable to the taxpayer.

Option 4

- This option is the slowest to design and implement, what certainty can there be for investors in the interim that forestry removals are incentivised during this phase of uncertainty while consultation is reviewed, an election, and the intentions of a new government.
- Craigmore agrees with the statement that the degree of investment certainty for removal activities would depend on the design and confidence in this new market.
- Further detail on design and implementation consultation is needed on the critical question of who would purchase removal units, and how is price set?
- There is insufficient information contained in this high-level consultation to understand how these options would affect the Craigmore business.
- In principle the reverse auction appears to be the fairest pricing methodology (over fixed pricing).
- The government purchasing removal NZUs and then effectively selling these to emitters at a much higher price would have multiple benefits:
    - Funds could be used for funding biodiversity premiums for NZUs from indigneous (the government purchases indigenous NZUs at a higher price)
    - Prevents landowners from pocketing large windfall gains from selling marginal sheep and beef farms at 2x the farming value.
    - Gives pricing certainty to foresters – reducing discount rates, and lowers the cost of removals.
    - Allows the cost of GHG emissions returns to increase to a more suitable level, without distorting the land market, with unsustainable price increases there the potential for dairy farms being planted in forests.
- This option would require an immediate transition plan and strong policy statements about minimum prices to mitigate the market uncertainty that would occur during the design and implementation phase.

Craigmore does not support:

Option 3

- A separate price for removal NZUs compared to reduction NZUs if operating under the same scheme.
- Craigmore does not support restrictions on the surrender obligations generated through removal activities and agrees with the statement that this is a fundamental shift in integrity of NZUs, 1 tonne of CO2 Equiv is 1 tonne CO2 Equiv, and may create issues of inequity for forestry surrender e.g. due to stock-change harvesting.
- Craigmore does not support vintaging that is restricted to removals. Vintaging of NZUs that are not issued from a removal may have merit (e.g. the government auction units). Vintaging is complicated when it comes to stock-pile units that are held for genuine surrender liability.

6.4. Are there any additional options that you believe the review should consider? Why?

Any fixed quota for afforestation areas to entered into the ETS could have merit provided it was for a long period e.g. 10 years, as afforestation on the right land is needed to occur more quickly, and not at a slower gradual pace. The issue is to agree what constitutes the “right land”. Potentially a fixed limit of say 600,000 ha of afforestation land in the ETS would send a signal that removals will not be forever and increase the pace of afforestation – provided land use settings were in place to ensure the right land was planted.

Annual quotas for entering afforestation land into the ETS would create division and complexity and slow down afforestation on the right land, increasing NZ’s NDC Paris Accord liability.

6.5. Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

The next consultation should bring together all relevant policy strands into a forestry-focus policy, that includes the ETS.

With Urgency: as a first stage in a transition plan, announce a policy intent position statement to give certainty to the market to support existing investment programme that are already underway e.g. floor carbon price under all options for removals and potentially a cap as well, to remove speculation, and certainty of how existing ETS participation and NZUs held will be treated.

Auctions: Lift the reserve price for NZU auctions even further, to reduce the inventory caused by these auctioned NZUs.

Planning - Implementing changes to NES for plantation and permanent forestry so that the right tree is planted in the right place for the right amount of time. For example, farmland owners looking to plant trees could be required to obtain an afforestation assessment to identify the areas that do not support plantation forestry, permanent *Pinus radiata* etc. Large continuous areas of Land Use Class 1-5 to be excluded, and extremely erodible areas to be limited to native plantings. Craigmore is already doing this on a voluntary basis – imposing limits beyond the rules set out in the current NES. This would prevent land sales processes forcing potential purchasers in planting every hectare in *Pinus radiata*.

OIO regulations - Extend the current exemption for listed companies to allow <50% offshore ownership of farmland, rather than <25% currently. This would allow the aging farmland landowners to partner with offshore capital in mixed farming systems, and support more targeted planting and more vibrant rural economy.

Biodiversity – any solution should include a mechanism to use gains from exotic afforestation to support much more native afforestation e.g. having NZUs from native forestry removals not being subject to any price cap or government-only purchasing requirement.

Transition investment in the rural sector – implement a programme to support the transition of rural communities where land use change is more prevalent to transition e.g. rural school support, broadband investment, re-training programme for other growth sectors – such as horticulture.

6.6. Do you agree with the assessment of how the different options might impact Māori?

Agree
Disagree
Unsure
Which are the most important? Write your answer here

No comment

Chapter 7: Broader environmental outcomes and removal activities

7.1. Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation?

Yes

These should be strongly considered.

For Craigmore, OIO rules also impact our ability to plant indigenous as the forestry investment must be for production. We are currently planting 2-3% in indigenous due to the economics (establishment costs and ETS returns). With strengthened ETS settings for indigenous we could increase this to 10-15%, but not beyond due to OIO rules.

The parallel consultation of biodiversity credits is where the additional benefits indigenous could be recognised. This should be additive to recognition for removals in the ETS (whether or not it is incorporated into the ETS itself).

7.2. If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

No comment

7.3. Should a wider range of removals be included in the NZ ETS?

Unsure

Incorporation of other removals should always be considered if can be proven scientifically and measured. Otherwise valid removals that emerge in the future (e.g. capture of CO_2 from burning biomass, and storing carbon permanently) would fail to ever obtain investment. We should not think that afforestation is the only removal tool that will emerge over time.

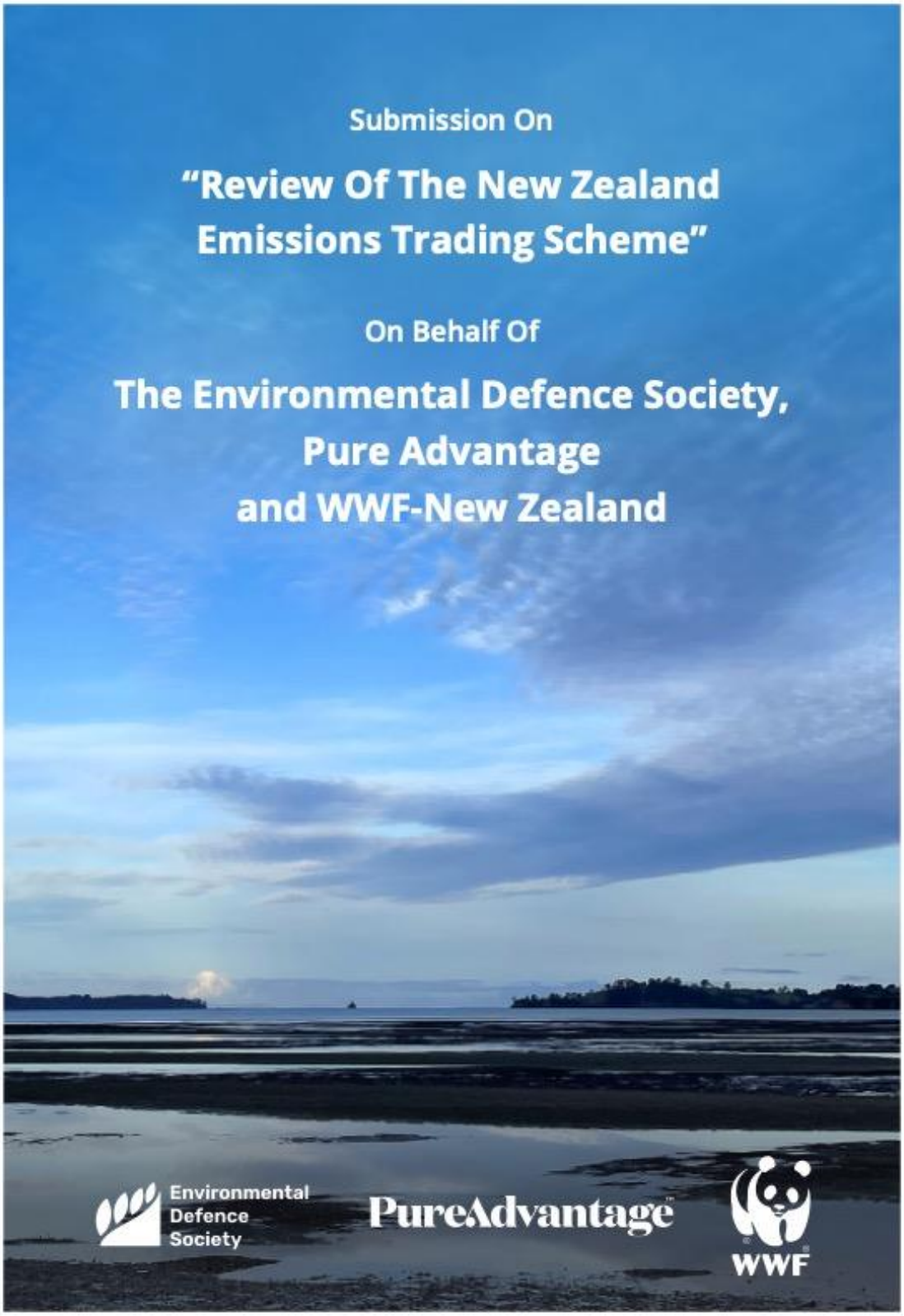
However, we have an ETS that is supposedly not functioning. Therefore, adding other removals should be less of a priority in the short term.

Even more important is to create a framework to allow voluntary schemes to operate in NZ. It is dangerous to limit GHG reduction and removal frameworks to only the ETS – which is subject to political volatility. Giving space for private sector voluntary schemes to emerge will encourage more innovation in removals and a more stable investment environment.

7.4. What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

Biodiversity credit system.

Renewal of a grant scheme (e.g. 1 billion trees) to subsidise the costs of indigenous afforestation with targeted environmental benefits, e.g super wide riparian, land that is high-risk erosion prone.


Submission On
"Review Of The New Zealand Emissions Trading Scheme"
On Behalf Of
The Environmental Defence Society, Pure Advantage and WWF-New Zealand
Environmental Defence Society
PureAdvantage
WWF

SUBMISSION ON "REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME"

on behalf of

THE ENVIRONMENTAL DEFENCE SOCIETY, PURE ADVANTAGE and WWF-NEW ZEALAND

Submitter Details

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Date	11 August 2023

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Date	11 August 2023

1 Introductory comments

1.1 This is a joint submission on behalf of the Environmental Defence Society (**EDS**), Pure Advantage, and WWF-New Zealand (together, 'we') in relation to the Ministry for the Environment (**MfE**), Ministry for Primary Industries (**MPI**), and Ministry for Business, Innovation & Employment's (**MBIE**) consultation on the "Review of the New Zealand Emissions Trading Scheme" (**ETS Review**) Discussion Document (**Discussion Document**).

1.2 EDS is a not-for-profit, non-government national environmental organisation. It was established in 1971 with the objective of bringing together the disciplines of law, science, and planning to promote better environmental outcomes in resource management.

1.3 Pure Advantage is a registered charity led by business leaders and supported by a collective of researchers and writers who investigate, communicate and promote opportunities for Aotearoa New Zealand to fulfil its potential for green growth.

1.4 WWF-New Zealand is a not-for-profit, environmental non-government organisation, and part of the international environmental organisation WWF (World Wide Fund for Nature). Our mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature. We bring together individuals, communities, businesses, and government to develop and implement innovate, evidence-based solutions.

1.5 This joint submission is informed by expert input from Dr Christina Hood.

2 Summary of submission

2.1 The current design of the New Zealand Emissions Trading Scheme (**NZ ETS**) will not drive urgent and deep gross emissions reductions in line with limiting global warming to within a 1.5°C increase. We therefore agree that it is not fit for purpose.

2.2 The equivalent treatment of, and emitters' unlimited access to, forestry removals is:

(a) Displacing gross emissions reductions in favour of exotic forestry removals on the basis of relative short-term investment cost;

(b) Delaying cost-effective low carbon technology investments and discouraging innovation;

(c) Driving and locking in unsustainable levels of exotic monocultural afforestation that:

i Will not provide a long-term, climate-resilient, biodiverse and regenerative carbon sink necessary to meet Aotearoa New Zealand's climate obligations and biodiversity targets; and

ii Is inconsistent with tackling the interrelated climate and biodiversity crises simultaneously and synergistically as we have undertaken to do pursuant to *Te Mana o te Taiao*, the first Emissions Reduction Plan, and the Kunming-Montreal Global Biodiversity Framework;[1]

(d) Out of step with emissions trading schemes, and climate action generally, in comparable jurisdictions with the risk of reputational and trade-related repercussions;

[1] Refer Targets 8 and 10.

(e) Subject to growing international scrutiny and criticism, with "offsetting" fossil fuel emissions increasingly viewed as "greenwashing"; and

(f) Intergenerationally inequitable and immoral, constraining land-use flexibility and transferring the burden of economic transformation to future generations, who will be dealing with the worsening effects of climate breakdown and for which we bear responsibility.

2.3 We further agree that addressing these issues necessitates decoupling and recalibrating the incentives for forestry removals vis-à-vis gross reductions.

What are we trying to achieve: Articulation of <u>desired</u> outcomes critical for proper options analysis

2.4 The Discussion Document lacks a clear indication of the desired (rather than various potential) outcomes sought against which to properly assess the range and appropriate mix of options proposed. Our comments on the various options proposed are constrained by the absence of such clarity. We look forward to engaging in further, more detailed consultation and feedback when the desired outcomes and level of ambition Government is willing to commit to are clearly identified.

2.5 In this regard, the Climate Change Commission maintains that:

(a) A clear commitment to a specific level of gross emissions reductions;
(b) Indicative levels of removals from forestry;
(c) The separation of incentives for gross emissions reductions and forestry removals in the NZ ETS; and
(d) Developing "durable" incentives for removals to and beyond 2050;

in respect of which policy choices should align, are "fundamentals for success".[2]

2.6 We agree with those fundamentals.

2.7 We further submit the need to:

(a) **Strengthen the legislative purpose of the Climate Change Response Act (CCRA), and the 2050 targets** thereunder, to ensure these mandate an emissions reduction pathway genuinely consistent with a 1.5°C future and from which the adequacy and efficacy of subsidiary regulatory and policy settings derive;

[2] Climate Change Commission *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan* (**Climate Change Commission 2023 Draft Advice**), April 2023, at 13.

(b) Adopt **temporal horizons** that:

i **Prioritise deep and rapid gross emissions reductions by 2030** to avoid locking in emissions-intensive choices with subsequent economic regrets;

ii **Incentivise urgent indigenous reforestation (and restoration)** *now*[3] with a view to **realising a net-negative emissions and nature positive future from 2050 and beyond** and ensuring that nationally determined commitments are indeed realised through the prioritisation of domestic action (consistent with the Government's stated intent in the first Emissions Reduction Plan[4]); and

iii Require strategic consideration and optimisation of the types, roles, location, scale and co-benefits of long-lived greenhouse gas removals, particularly forests,[5] across multiple generations; and

(c) In light of the above, and recognising the need to support ongoing emissions drawdown and storage, accelerate the development of **a carbon removals strategy** that:

i Will deliver high quality, risk-adjusted (for climate resilience and adaptive capacity) sequestration through stable and credible financial support for establishment (and restoration) and ongoing maintenance;

ii Is designed (and implemented urgently) to secure sustained carbon storage in perpetuity (i.e. for permanence);

iii Aligns with robust environmental integrity standards consistent with the best available science and international practice;

iv Delivers and optimises biodiversity and other co-benefits and establishes an intergenerational natural infrastructure asset in the public interest; and

v Minimises land-use inflexibility by supporting a mosaic land-use approach.

[3] The Climate Change Commission notes that we will need forestry to meet our future nationally determined contributions and that forests planted in the 2020s could provide a substantial portion of the net emissions reductions require to meet them: Climate Change Commission 2023 Draft Advice, at 42.
[4] *Te hau mārohi ki anamata* - Towards a productive, sustainable and inclusive economy; Aotearoa New Zealand's First Emissions Reduction Plan, May 2022 (First Emissions Reduction Plan), at 28.
[5] This includes the role of plantation forests, both for removals and for bioenergy, low emissions construction materials, etc.

3 Getting the settings right: (In)Sufficiency of our legislative commitments to limit global warming to 1.5°C

3.1 As the time of writing, the global north is in the grips of record-breaking and life-threatening terrestrial and marine heatwaves, prompting United Nations Secretary General, António Guterres to announce that "the era of global boiling has arrived."[6] Catastrophic wildfires and destructive flash flooding are widespread. Devastating global climate impacts are increasingly evident and set to worsen: "Climate change is here. It is terrifying. And it is just the beginning."[7]

3.2 Doing everything we can, as urgently as we can, to hold the global mean temperature increase to 1.5°C above pre-industrial levels - beyond which science suggests a cascade of even graver and potentially irreversible impacts is probable - has never been more pressing.

Climate Change Response Act's 'aspirational' approach to 1.5°C-compatible pathway irreconcilable with the existential threat climate change presents

3.3 Recognising the risk, gravity and pace of impending climate collapse, Parliament passed a motion **declaring a climate emergency** on 2 December 2020. In doing so, it committed to take **urgent action** on greenhouse gas mitigation, referencing the need to avoid more than a 1.5°C global average temperature rise above pre-industrial levels.

3.4 The first Emissions Reduction Plan similarly acknowledged that the challenge of decarbonisation "is as urgent and important as it has ever been" and that "[t]he science tells us that **limiting global warming to 1.5°C above pre-industrial levels gives us the best chance of avoiding the worst effects**."[8] Within that threshold, it would be easier for ecosystems, food and health systems to adapt, reduce the cost of adaptation, and significantly reduce the number of people exposed to risks associated with sea level rise and climate-induced water constraints.[9]

3.5 However, our primary climate change legislation - the CCRA - which sets out the legal ambition of our mitigation commitments and from which the strength and effectiveness of subsidiary implementation policies and regulatory tools (like the NZ ETS) derive, does not legally *require* our policy makers to design these in accordance with a 1.5°C-compatible pathway.

3.6 In *Lawyers for Climate Action NZ Incorporated (**LCANZI**) v The Climate Change Commission*,[10] Mallon J found that the purposive wording of the CCRA[11] in relation to limiting the increase

[6] https://www.theguardian.com/science/2023/jul/27/scientists-july-world-hottest-month-record-climate-temperatures
[7] Ibid.
[8] First Emissions Reduction Plan, at 8.
[9] First Emissions Reduction Plan, at 29.
[10] [2022] NZHC [3064].
[11] Section 3(1)(aa)(i) provides that "The purpose of this Act is to – (aa) provide a framework by which New Zealand can develop and implement clear and stable climate change policies that – (i) **contribute to** the global effort under the Parise Agreement to limit the global average temperature increase to 1.5° Celsius above pre-industrial levels".

in global average temperature to 1.5°C above pre-industrial levels is merely '**aspirational**',[12] not obligatory.

3.7 In light of the:

(a) Comprehensive body of international scientific evidence on the need to limit the global average temperature increase to 1.5°C above pre-industrial levels for a liveable future;
(b) IPCC's "final warning" to the world's governments on the need to swiftly and drastically reduce emissions; and
(c) Daily news coverage of its already terrifying impacts,

it seems extraordinary that our primary climate change law does not enshrine a *legal duty* on the Government to ensure that targets and policies are designed and implemented consistent with 1.5°C - what LCANZI submitted should be treated as a climate "bottom line".

3.8 We do not have the luxuries of time or choice to view the 1.5°C threshold as an aspirational commitment. It is a moral and, indeed, an *existential* obligation. Such a conservative and complacent legislative approach to the pursuit of a liveable future, which materially shapes the strength of endeavour, urgency, and design of all subsidiary regulatory and policy responses, should be urgently revisited.

3.9 Until that happens, and whilst acknowledging that both the Climate Change Commission and policy makers are constrained by the current language of the CCRA, we encourage officials to undertake this ETS Review in a way that will allow for a critical and dramatically increased level of ambition before change to the legislative framework is achieved.

Our "net zero" 2050 target is not 1.5°C-aligned

3.10 Our "net zero" and biogenic 2050 emissions targets similarly fall short of that which is necessary to achieve a 1.5°C future. And even against these, we are not on track.[13]

3.11 The IPCC's 2018 Special Report found that **reducing emissions to net zero by 2050 is not sufficient to limit warming to 1.5°C** and **deep emissions cuts must be made by 2030 for a 50-60% chance of limiting warming to less than 1.5°C**.[14]

3.12 In other words, the extent of gross emissions reductions over the next 6-7 years really matters. In its most recent draft advice, the Climate Change Commission has echoed the need for prompt and decisive action[15] to reduce **gross emissions** from *all* sources **as much as**

[12] Per Mallon J, at para [162].
[13] Discussion Document, at 17.
[14] Referenced by Mallon J, in *Lawyers for Climate Action NZ Incorporated v The Climate Change Commission,* op cit above n 9, at para [82].
[15] Climate Change Commission Draft Advice 2023, at 36.

possible and **as soon as possible** (observing that both emission reductions and the effects of delay accumulate over time),[16] rather than relying on offsetting our climate pollution.[17]

No gross emissions reduction target and no constraint on removals

3.13 Contrary to this:

(a) Our Government has not specified *any* gross emissions reduction target; and
(b) There is *no constraint on the use of removals* to meet our "net zero" 2050 target.

Technically then, Aotearoa New Zealand could meet its "net zero" 2050 target entirely through forestry offsets, with no gross emissions reductions. As Wilson et al note, such "**large-scale, unfettered deployment of carbon offsets** enabling ongoing exploitation of fossil fuels **severely jeopardises the 1.5 temperature limit**."[18]

3.14 The United Nations Environment Programme has stated that "at most, offsets should be a temporary measure until 2030 and can lead to complacency towards achieving actual emissions reductions."[19]

3.15 The IPCC has similarly warned that land-based removals "cannot compensate for delayed emissions reductions in other sectors".[20] In the most recent IPCC Sixth Assessment report, scenarios that limit warming to 1.5°C with no or limited overshoot achieve "net zero" for fossil fuel emissions through over 91% reduction in gross emissions, with most of the residual emissions balanced by permanent geological storage. Only 4% of the initial fossil fuel emissions are balanced by land-use removals in these scenarios.[21]

3.16 In light of these concerns and aligning with the IPCC's analysis, the Science Based Targets Initiative's corporate Net-Zero Standard "asserts that *at least 90%* of a 2050 net zero target should be achieved with *actual emissions reductions* within their value chain, leaving a maximum of 10% that could be addressed through the purchase of offsets."[22]

Reputational risks in the absence of a specific gross emissions reduction target

3.17 The Climate Change Commission has warned of increasing international scrutiny of plans to deliver on climate commitments, with many climate researchers and organisations recommending that net zero commitments should:

(a) Focus foremost on directly reducing emissions; and

[16] Climate Change Commission Draft Advice 2023, at 36: "even short delays in acting to reduce gross emissions could result in increasing larger shortfalls in future emissions budgets, because the impacts of the delay accumulate" (Discussion Document refers, at 31).
[17] Climate Change Commission Draft Advice 2023, at 1.
[18] Climate Analytics (2023). Why offsets are not a viable alternative to cutting emissions, at 19.
[19] Cited in Climate Analytics (2023). Why offsets are not a viable alternative to cutting emissions, at 46.
[20] IPCC (2022) cited in Climate Analytics (2023). Why offsets are not a viable alternative to cutting emissions, at 46.
[21] IPCC Working Group 3 Summary for Policymakers, Figure SPM.5.
[22] In Climate Analytics (2023). Why offsets are not a viable alternative to cutting emissions, at 47.

(b) Specify intended levels of gross emissions reductions.[23]

This would enhance transparency and credibility, and provide more direction and certainty for policy makers on the shape of the transition and how to align policies and tools – including the NZ ETS – in support of this.[24]

3.18 We also share the Minister of Energy and Resources' concern regarding the sequencing of the ETS Review before identifying the desired levels of gross and net emissions that the ETS redesign options should drive.[25] This in turn relates to, and relies on, the adequacy of our legislative commitments and targets, discussed at paras 3.3 – 3.12 above.

3.19 The adequacy of, and urgency of meeting, our 2050 target can - and, in our view, should - be reviewed. As summarised by Mallon J, the CCRA provides that the Climate Change Commission:[26]

> "must review the 2050 Target when preparing advice for a budget period on or after 2036 and any other time the Minister requests such a review (Section 5S(1)). On such a review, **the Commission may recommend a change to the time frame for achieving the 2050 Target; the levels of emission reductions required; the gases, emissions and removals to which the 2050 Target applies; and how the 2050 Target may be met (including limits on removals and offshore mitigation)** (section 5T(1))."

3.20 However, the grounds upon which the Climate Change Commission can recommend a change (set out in Section 5T(2)(a) of the CCRA) require that a "*significant change*" must have occurred, or is likely to occur, to one or more of the following as they relate to climate change:

(a) Global action;
(b) Scientific understanding of climate change;
(c) New Zealand's economic or fiscal circumstances;
(d) New Zealand's obligations under relevant international agreements;
(e) Technological developments;
(f) Distributional impacts;
(g) Equity implications (including generational equity);
(h) The principal risks and uncertainties associated with emissions reductions and removals;
(i) Social, cultural, environmental, and ecological circumstances;

[23] Climate Change Commission Draft Advice 2023, at 50.
[24] Ibid.
[25] The Cabinet Paper seeking agreement to the scope and process of reviewing the NZ ETS records that the Minister of Energy and Resources recommended sequencing work so that Ministers considered first what balance of gross and net emissions reductions the NZ ETS should drive, and then the options to amend the scheme in support of these levels. Paragraph 120 of that paper refers - see https://environment.govt.nz/assets/publications/cabinet-paper-and-minute-review-of-the-new-zealand-
[26] *Lawyers for Climate Action NZ Incorporated v The Climate Change Commission,* op cit above n 9, at para [46].

and the Commission must be satisfied that the "significant change" justifies the change to the target (Section 5T(2)(b)).

3.21 As Aotearoa New Zealand's current 2050 target is arguably insufficient across most, if not all of those section 5T(2)(a) measures, the threshold of "significant change" appears to be more than met.

Global action: We are not undertaking our "fair share" in reducing fossil fuel emissions

3.22 The principles of the United Nations Framework Convention on Climate Change and Paris Agreement call on developed nations, including New Zealand, to "take the lead" through national policies consistent with limiting global warming to 1.5°C,[27] protect the climate system "on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities",[28] "undertake rapid reductions … in accordance with the best available science",[29] and to "pursue domestic mitigation measures".[30]

3.23 Mallon J held that Aotearoa New Zealand's nationally determined contribution (**NDC**) "is the vehicle used to meet the relevant international law obligations arising from the Paris Agreement"[31] and that these do not need "to be met via the emissions budgets".[32] According to Climate Action Tracker, that target is "insufficient" having regard to our fair share, and reliance on significant offset purchasing to meet our 2030 NDC target. It submits that:

> "**New Zealand is set to meet by far the highest proportion of its target (two thirds of the action required) through buying international offsets compared with any other OECD country" which "would set an alarming precedent"**.[33]

3.24 This is contrary to the emphasis on meeting our global commitments primarily through domestic efforts (as required under the Paris Agreement and first Emissions Reduction Plan), and our responsibility, capacity, and quite simply the *need* to do so.[34]

3.25 It is also a result of having "made little progress reducing gross emissions to meet previous targets".[35] In this regard, the Climate Change Commission has warned that "[e]nsuring climate policies drive gross emissions down will help avoid a repeat of this situation"[36] and that while emissions reduction plans relate to achieving our emissions budgets, domestic

[27] UNFCCC, Article 3(1), 4(2)(a).
[28] Ibid.
[29] Paris Agreement, Article 4(1).
[30] Ibid, Article 4(2).
[31] *Lawyers for Climate Action NZ Incorporated v The Climate Change Commission,* op cit above n 9, at para [164].
[32] Ibid.
[33] https://climateactiontracker.org/countries/new-zealand/ (accessed 26.07.2023).
[34] We note here that we will never be able to meet our global obligations 100% through domestic efforts, nor should we; that is because international funding is part of our obligation as a wealthy developed nation, whether via carbon markets or climate finance. In this respect, it is important to both drive domestic gross reductions as hard as possible *and* still meet out NDC *as well as* to establish a long-term sink so that future NDCs can be met more through domestic efforts.
[35] Climate Change Commission 2023 Draft Advice, at 63.
[36] Climate Change Commission 2023 Draft Advice, at 63.

2050 target, and domestic contribution to limiting warming to 1.5°C, we need to "close the gap" between domestic and global contributions.

3.26 The Discussion Document acknowledges that "Aotearoa is still one of the highest-emitting nations in the world per capita."[37] Affidavit evidence submitted in *LCANZI v The Climate Change Commission* similarly noted that New Zealand ranks 166th out of 180 countries when ranked from lowest to highest per capita emitters;[38] and in terms of historic cumulative emissions per capita from 1850 to 2021, New Zealand is one of the highest emitters.[39] We could and should be doing more to account for our historical and current emissions contributions in order to "play our part".[40]

3.27 Other developed countries are focusing on steeper cuts to gross emissions. The risk of being economically, technologically, ecologically, socially, reputationally, and morally left behind should not be understated. Our recent free trade agreement with the European Union - the first under its new framework on trade and sustainable development - requires the parties to hold each other accountable for the commitments both have made under the Paris Agreement.

3.28 Carbon border tax adjustments, access to markets and finance, and evolving consumer awareness and preferences could deliver trade advantages or barriers depending on our commitment - or failure - to accelerate the decarbonisation of our economy.

Global action: Contributing our "fair share" of permanent removals towards future net-negative targets

3.29 Undertaking our fair share in reducing gross fossil fuel emissions is one side of the coin. We also need to scale up our contribution of permanent removals. Together, these will put us in the position to meet future nationally determined contributions with a much greater share of domestic action. We discuss this further in paras 4.11 - 4.27.

4 Like the CCRA and its 2050 net zero target, the design of the NZ ETS is (consequently) not 1.5°C-compatible

4.1 The NZ ETS is currently our key tool for meeting our 2050 net zero target. Unlike any other emissions trading scheme, it fully incorporates forestry for both removals and emissions and treats both as equivalent.[41]

4.2 The NZ ETS's ambivalent and unlimited approach in respect of whether emitters meet their obligations through removals or gross emissions reductions enables participants to take an investment approach to abatement that minimises the costs they face.

[37] Discussion Document, at p 6.
[38] At para [311], per Professor Ralph Sims, citing the Yale Centre for Environmental Law and Policy.
[39] At para [311], according to analysis by Carbon Brief.
[40] Discussion Document, at p 6.
[41] Climate Change Commission Draft Advice 2023, at 55.

4.3 This 'net' emissions approach favours removals by way of extensive *Pinus radiata* afforestation, which is relatively cheap and reliable to grow, and provides rapid sequestration, over reducing gross emissions: it is cheaper in the short term to remove 1 tonne of carbon through forestry than it is to avoid emitting 1 tonne of carbon through investing in low-emissions technology.[42] And it is more lucrative (on an externalisation of downstream costs basis)[43] to plant pines than indigenous forests.

4.4 The result has been to encourage industrial plantation (and more recently, exotic 'carbon' or 'permanent') forestry, in respect of which carbon sequestration and storage (and any co-benefits) are inherently short-term (limited to plantation cycles / natural longevity), and value chain emissions are ignored.

4.5 Such a simplistic approach to incentive design thereby narrows the scope of relevant considerations to short-term cost minimisation. It is not designed to interrogate the ***quality*** or ***durability*** of removals, which is a missed opportunity to secure co-benefits, particularly in relation to biodiversity, which the Government has undertaken to do pursuant to *Te Mana o te Taiao,* the first Emissions Reduction Plan, the National Adaptation Plan, and in adopting the Kunming-Montreal Global Biodiversity Framework.

The issue with "equivalence" and the risks of impermanence

4.6 The full equivalence and unlimited availability of forestry removals in the NZ ETS, and resulting over-reliance on them as an abatement strategy, is extremely concerning for a number of reasons:

(a) The effect of equivalence is to "allow the enablement of continued extraction and burning of fossil fuels"[44] by sanctioning the *displacement* of an equivalent reduction in gross emissions;

(b) Fossil fuel emissions have such a long lifetime in the atmosphere that, for practical purposes, the warming they produce is 'forever':[45]

> "Each tonne released into the atmosphere is long-lived, with around 40% remaining after 100 years, 20-25% remaining after 1,000 years, and up to 20% after 10,000 years. **Land-based offsets do not and cannot guarantee such long-term sequestration**."

[42] Discussion Document, at 14.
[43] These are well canvassed in the findings of the Ministerial Inquiry into Land Use on the East Coast. Another cost, is wilding pines which, if left uncontrolled, will pose a $4.6 billion threat to the national economy: https://www.wildingpines.nz/assets/Documents/Wilding-Pines-DLE-info-leaflet-WEB.pdf.
[44] Climate Analytics (2023). Why offsets are not a viable alternative to cutting emissions, at 6.
[45] Ibid, at 14, 4.

To fully compensate for the warming impact of carbon dioxide any removals would need to store these emissions **over millennial timeframes**.[46]
By comparison:[47]

> "the majority of land-based carbon dioxide removal has permanence timescales of decades to a century, which substantially undermines the validity of offsetting fossil carbon emissions by these methods. There is therefore a **fundamental difference between directly reducing a source of carbon dioxide emissions by one tonne, and offsetting that same tonne of carbon dioxide emissions through sequestration in trees or soil."**

(c) Hotter and drier conditions are likely to compromise the ability of forests to uptake, store and hold carbon;[48]

(d) Land carbon is inherently reversible through human activities and disturbances, including climate change (with increasing risks of, and susceptibility to, wildfire, pest incursions, disease, windthrow and instability, storm damage, and drought). This renders removals "fundamentally inferior to reducing actual emissions at their source."[49] In this respect, Wilson et al submit that removals used as offsets for fossil fuel emissions need to be:

i **Maintainable in perpetuity** because their 'reversal' at any time can invalidate their storage; and

ii Maintained over timescales **such that they counteract the effect of an equivalent amount of greenhouse gases emitted to the atmosphere**.[50]

(e) The reduction of emissions at source is permanent. By contrast, carbon emissions that are captured and stored in trees will at some point be released back into the atmosphere. An "offset" approach to forest sequestration therefore risks *higher levels of carbon dioxide concentrations in the longer term* due to the displacement of reductions at source and the release of stored carbon. And any liability imposed for the loss of stored carbon is unlikely to realise that loss in practice, both in monetary and biophysical terms[51] - this is a fundamental problem; and

(f) There is "strong and growing opposition to the use of offsets and demands for global action to limit it."[52]

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[46] Ibid, at 14.
[47] Ibid.
[48] Ibid, at 3, 16.
[49] Ibid, at 9.
[50] Ibid, at 18.
[51] In theory, a forest participant would be required to remove a quantity of CO2 equivalent to the reversal. In practice, specific performance and pecuniary penalties can be frustrated through the protections afforded by the corporate veil: if the value of the carbon credits earned exceed the land value when purchased, limited liability corporate forest owners and investors can liquidate the company to avoid such obligations.
[52] Climate Analytics (2023). Why offsets are not a viable alternative to cutting emissions, at 7.

Driving deep, rapid and sustained gross emissions reductions must be prioritised

4.7 Proper alignment with limiting global mean temperature increases to 1.5°C requires urgent and substantial reductions in fossil fuel emissions.

4.8 Global scenarios consistent with limiting warming to 1.5°C, including those of the IPCC Sixth Assessment Report and the International Energy Agency's net-zero-energy scenario, require deep reductions in fossil fuel emissions by 2050, with over 90% of the "net zero" goal achieved through gross reductions. The residue is balanced mostly by permanent geological storage, with only a small amount of offsetting from forestry removals in the IPCC scenarios, and none in the IEA's net-zero energy scenario.

4.9 Internationally, other emissions trading schemes similarly focus on driving gross reductions. Any offsetting allowed is minimal. The EU, for example, has significant forestry removals but does not allow these as "offsets" in its emissions trading scheme as it is understood that the task of that scheme is to reduce gross emissions. The EU is currently exploring establishment of a parallel "removals market" that would allow for permanent offsetting of residual emissions once deep gross reductions have been achieved.

4.10 By comparison, the NZ ETS's unlimited access to, and equivalent treatment of, forestry offsets, means it is simply not a credible tool to drive emissions reductions. Aotearoa New Zealand needs to catch up quickly to align with global norms.[53]

4.11 Aotearoa New Zealand should not delay its transition to a low-carbon economy because we happen to have land available for afforestation.

However, we still need to incentivise long-term permanent forestry removals

4.12 Whilst forestry removals, from both existing forests and new planting, are not (and should not be treated as) a substitute for emissions reductions at source, they are critical to meeting Aotearoa New Zealand's emissions budgets, our 2050 "net zero" target, and our nationally determined contributions under the Paris Agreement.

4.13 That is because, even with steeper gross emissions reductions, our near-term emissions budgets have been set assuming some reliance on forestry removals. There are also emissions currently outside the NZ ETS that are part of the net-zero target, as well as fossil fuel emissions from international aviation and marine transport. This means that longer-term assessments of demand for forestry removals should not only consider existing ETS emitters.

4.14 To protect New Zealand's role as a food producing nation, we should also anticipate that agricultural emissions may need to be significantly reduced and residual emissions offset in

[53] We note that the Climate Change Commission's demonstration path includes far more forestry offsetting than in global 1.5°C-consistent scenarios. This is not a criticism of the Commission, but indicative of the legislative constraints - including the current 2050 net zero target - within, and in respect of which, its advice must be provided. It did not, therefore, have the mandate to recommend **truly 1.5°C-consistent** pathways.

the near future. The Science Based Targets initiative has developed a new methodology and sector guidance in support of this,[54] and pressure to take action is already evident from customers.[55]

Future proofing our removals strategy: the need to look well beyond 2050 to address global emissions overshoot

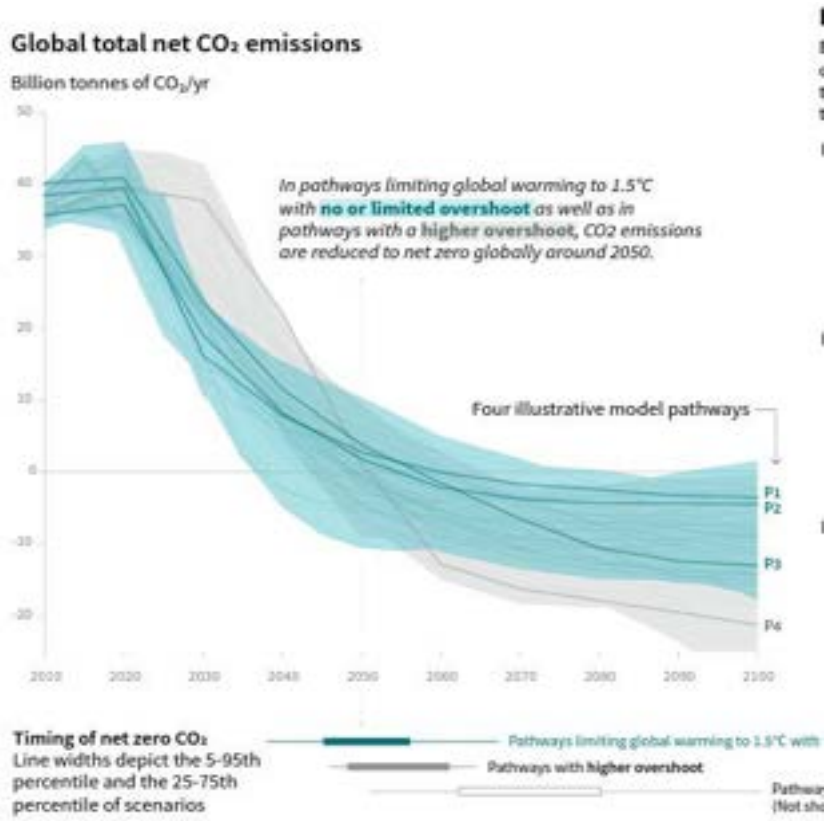
4.15 It is this need to build a long-term enduring carbon sink **for the second half of this century,** when the Paris Agreement requires global emissions to be net-negative, that is often overlooked.

4.16 In IPCC scenarios consistent with keeping temperature to 1.5°C in 2100 there is overshoot: the world over-emits and then needs to remove CO_2 from the atmosphere with technology and nature-based solutions.

4.17 The Sixth Assessment Report (Working Group III Summary for Policymakers Table C.SPM.2, C1 and C2 scenarios)[56] puts the quantity of net-negative emissions from mid-century to 2100 at 360Gt in scenarios where there is a larger overshoot.

4.18 The more we overshoot, the greater level of net-negative emissions is needed later, as shown in the following graph from the IPCC special report on Global Warming of 1.5°C[57]. Note that the quantity of removals needed globally is even higher, as there is also a small quantity of residual emissions to offset.

[54] https://sciencebasedtargets.org/sectors/forest-land-and-agriculture
[55] https://www.newsroom.co.nz/fonterra-sets-new-emissions-intensity-target-for-dairy-farmers refers.
[56] IPCC, 2022: Summary for Policymakers [P.R. Shukla, J. Skea, A. Reisinger, R. Slade, R. Fradera, M. Pathak, A. Al Khourdajie, M. Belkacemi, R. van Diemen, A. Hasija, G. Lisboa, S. Luz, J. Malley, D. McCollum, S. Some, P. Vyas, (eds.)]. In: *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA. doi: 10.1017/9781009157926.001, C.SPM.2: Scenarios C1 and C2.
[57] https://www.ipcc.ch/sr15/



"Taking the lead", "playing our part", and undertaking our "fair share"

4.19 Aotearoa New Zealand has contributed to this overshoot. On a per-capita basis, our CO_2 emissions since pre-industrial are well above the global average, through a combination of fossil fuel use and land clearing. The New Zealand Agricultural Greenhous Gas Research Centre (as quoted in the Climate Change Commission's *Ināia Tonu Nei* advice[58]) estimates that Aotearoa New Zealand has contributed close to 0.3% of warming since pre-industrial times. Just for carbon dioxide, our share is 2.6 times the global per-capita average.[59]

4.20 Aotearoa New Zealand, like other developed countries and large emitters, should take responsibility for our 'fair share' of correcting this overshoot. Our 'fair share' is an ethical judgement and will not just be our per-capita contribution to the overshoot, but would also take into account our capacity as a relatively wealthy developed country, and our ability to act (as a country with deforested land able to be restored).

4.21 Even on a per-capita basis, our 'share' (at 2.6 times the global per-capita average) could be over 500Mt of net-negative emissions by 2100, or 10-20Mt per annum out to 2100. And the need for removals does not end in 2100 - it continues.

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[58] Climate Change Commission, *Ināia tonu nei:* a low emissions future for Aotearoa - Advice to the New Zealand Government on its first three emissions budgets and direction for its emissions reduction plan 2022 – 2025 (31 May 2021), at p 189.

[59] https://environment.govt.nz/what-government-is-doing/cabinet-papers-and-regulatory-impact-statements/consistency-of-ndc1-with-efforts-to-limit-global-warming-to-1-5-degrees/, at p 15, Table 2, see net 1850-2019.

4.22 The graph on the following page from *Inaia Tonu Nei* shows Aoteraoa New Zealand's contributions to warming: land use change (brown) has a higher impact on current warming than all fossil fuels ever emitted (red).

4.23 It is also interesting to observe that current warming from agricultural emissions (blue + green) is greater than warming from all fossil fuels (red) we have ever emitted.[60]

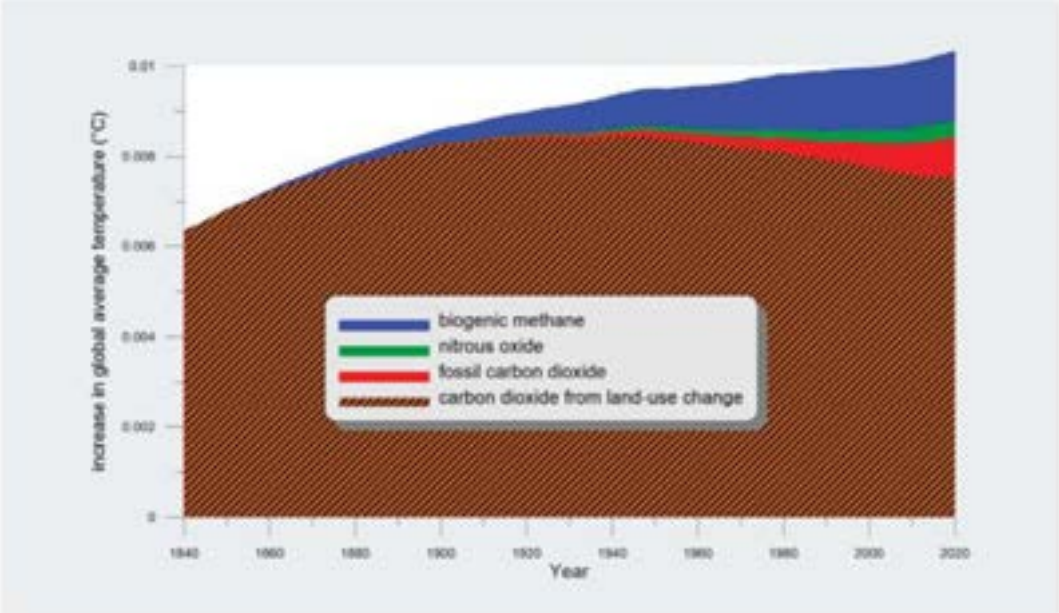

Figure 9.2: The contribution Aotearoa made to warming since 1840
Source: New Zealand Agricultural Greenhouse Gas Research Centre.

Premium removals: Taking the lead on addressing climate change and biodiversity loss together

4.24 A significant part of Aotearoa New Zealand's contribution to warming is a result of deforestation. As the first Emissions Reduction Plan noted:[61]

> "Since human arrival in Aotearoa, deforestation to make space for settlements, farms and other land uses has decreased native forest cover from around 80 per cent to 23 per cent. **That deforestation has released an estimated 12 Gt CO_2 into the atmosphere. Today, native forests cover around 7.8 million hectares and store approximately 1.8 Gt CO_2.**"

[60] Current warming is the level shown at the right-hand side of the graph for 2020. This is warming in 2020 caused by all historical emissions.
[61] First Emissions Reduction Plan, at 85.

4.25 The first Emissions Reduction Plan further recommends that:[62]

> "**Looking after these forests is one of the most important contributions Aotearoa can make to combatting global climate change.** We also have **a significant opportunity to develop native forests that both act as long-term carbon sinks and support biodiversity,** which aligns with the goals of the Biodiversity Strategy."

In doing so, we can bring ourselves back into balance with the atmosphere, as well as within our domestic ecosystems, by restoring native forests that should never have been cut down.

4.26 The ability of biodiverse indigenous forests to remove and store large volumes of carbon dioxide over much longer time horizons, and their natural resilience and adaptive capacity, make them critical to achieving net-negative emissions from 2050 and beyond.

4.27 Indigenous forests are also our pathway to reversing the catastrophic decline of our indigenous flora and fauna, and thereby present a scalable nature-based solution that would realise the Government's commitments to take an integrated approach to addressing the interrelated issues climate change and biodiversity loss.[63]

4.28 But because indigenous forests are slower and more expensive to establish in the short term, the availability of credible and enduring financial support (including through biodiversity payments) is urgent to ensure indigenous reforestation and restoration at scale starts *now* so that they are well established by 2050.

4.29 To this end, differential incentives that properly recognise the relative carbon sequestration and storage over time, natural resilience and adaptive capacity, and relative biodiversity, erosion control, and socio-cultural benefits as between indigenous forests and exotic plantations would better ensure the right tree in the right place for the right purpose. And would thus see the development of a premium indigenous forest-generated NZU.

4.30 If we act now to establish this long-term carbon sink, it will be in place when we need it. Indigenous forests take decades to reach peak growth, so we need to be putting them in the ground now. If we do, we will avoid the position we are in now of having to pay other countries to help us meet our nationally determined contributions as these reach net-zero and net-negative levels. Even at the lower end of Treasury estimates, reliance on international markets presents a major offshoring of wealth, with attendant access, reputational and environmental integrity risks.

4.31 Technological removals such as direct air capture (DAC) and bioenergy carbon capture and storage (BECCS) are only at experimental and demonstration phase - they are not currently commercially feasible or scalable. From a risk management perspective, it is prudent to establish this nature-based, relatively low cost, long-term carbon sink now.

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[62] First Emissions Reduction Plan, at 85.

[63] And there is a growing movement of support coalescing around this opportunity: https://pureadvantage.org/recloaking-papatuanuku/#intro

4.32 Establishing a long-term indigenous forest carbon sink should thus be viewed as a strategic natural infrastructure investment in the public interest that would put Aotearoa New Zealand in a much better position for the rest of the century, as well as putting right our own balance with the atmosphere and restoring local ecosystems. And it should be financed accordingly.

4.33 There is little risk in doing so, as high-quality carbon removals will have long-term international value: many other countries do not have Aotearoa's land availability to reforest. With the need to remove 7200Mt per year globally (360Gt/50yrs), Aotearoa New Zealand's high-quality removals will be sought after by countries without the options that we have.

Thus, we should not seek to "balance" incentives for gross emissions reductions against removals: <u>both</u> are needed

4.34 The Minister's introduction states that "[w]e need the NZ ETS to incentivise both emissions reductions and carbon removals from forestry". However, the NZ ETS cannot do both of these things on its own. That is because we are reaching a point, as explained in the Discussion Document, where ETS emitters will not provide sufficient demand for the forestry units generated.

4.35 We consider how this demand-side deficit could be addressed to incentivise high-quality, enduring forestry removals generated after 2035 in our high-level feedback on the Discussion Document detailed below (again noting that the lack of detail presented in the proposed options makes it difficult to assess their merits in achieving the objectives already outlined).

High-level feedback on the Discussion Document

Chapters 1 and 2

4.36 We agree that the current design of the NZ ETS:

(a) Is unlikely to drive material gross emissions reductions; and

(b) Will encourage reliance on removals, mainly from exotic forestry, for Aotearoa New Zealand to meet its domestic and international commitments (none of which are 1.5°C-aligned).

4.37 We also agree with the summary of exotic afforestation impacts. And while the "right tree in the right place for the right purpose" is important (in relation to the supply of wood, biofuels in a low carbon economy, etc), the primary focus for assessing forestry outcomes and options in the NZ ETS redesign needs to be on strengthening support for high-quality, enduring sequestration for removals beyond 2050 - i.e. indigenous reforestation and restoration.

4.38 We note that the Climate Change Commission's position regarding the likely risk of emissions-leakage is that these concerns - and therefore the justification for the quantum and slow phase-out rate for free allocations for emissions-intensive trade-exposed industries - are likely disproportionate to the risk.

4.39 Allowing for "a slower transition"[64] is not consistent with the climate emergency unfolding in real time. Whilst there are challenges associated with driving change quickly, there is an existential threat of being too complacent and economically 'protective' in the short term. There is moral risk too: Government must ensure decisions are taken that are in the public interest, not short-term commercial interests.

4.40 There has been no shortage of warnings that we are running out of time to limit global warming for a survivable future: we have had time to transition, and the opportunity and ability to mitigate any short-term sector-specific challenges associated with doing so.[65]

4.41 Further deferring a transition to low-emissions technology risks locking in emissions-intensive infrastructure and land-use to (mostly) exotic forestry, making reductions more expensive in the future and missing health benefits and economic savings from low-emitting activities in the meantime.[66] A path that may look "cost effective" in a blinkered short-term sense will be more costly in the long run.

4.42 Allowing for such deferral underestimates the innovative capacities to transform born from necessity to do so and ignores that our global partners are requiring their industries to do more. In light of our 'overshare' in contributing to historical global emissions, our current under-commitment and reticence to act presents a significant credibility and ethical deficit.

4.43 A strong, stable and increasing price on emissions is necessary to drive emissions reductions and can be influenced through existing levers controlling unit supply and price corridor, provided they are set carefully. We disagree with the Discussion Document's suggestion that the "[e]xisting price corridor indicates the price range that would support reductions in line with the emissions budgets and the 2050 target."[67] The Climate Change Commission's December 2022 analysis recommended a higher price corridor. The effect of ignoring that advice significantly impacted market confidence and the carbon price.

4.44 However, it is important to note that it is not the role of Government to identify "the exact prices required to drive gross emissions reductions".[68] The price corridor (which the Government *can* adjust) is meant to enable price discovery by the market. The focus should

[64] Discussion Document, at 38.
[65] Including support through the Government Investment in Decarbonising Industry Fund.
[66] Climate Change Commission Advice on Unit Limits 2024-2028, at 27.
[67] Discussion Document, at 34.
[68] Discussion Document, at 34.

instead be on the quantity of gross emissions and the right target to reduce these. These can in turn inform the preferred price pathway to achieve these.

4.45 We agree that regressive effects of emissions pricing on households and social and economic equity are best addressed and mitigated through initiatives outlined in the Equitable Transitions Strategy, including targeted support and carbon dividends. Use of complementary policies to achieve some of the emissions reductions can also moderate ETS prices.

Chapter 5

4.46 The reference to helping "drive more emissions reductions …. than the status quo"[69] is an inadequate and unambitious yardstick against which the options proposed should be assessed for it fails to convey the need for significantly deeper cuts in fossil fuel emissions.

4.47 In this regard, a clearly articulated gross emissions reductions target is necessary to properly assess the options: the level of ambition will determine the extent of redesign required, from tweaks to major reform.

4.48 Similarly for removals, the assessment of options depends on identifying how much sequestration we need across different temporal horizons - particularly from 2050 and beyond, and the desired quality and durability attributes of those removals.

4.49 We disagree with the suggestion that "trade-offs will be necessary between some criteria" and that "the main trade-off will be between the primary assessment criteria, namely: prioritising gross emissions reductions; and driving emissions removals."[70] This would defeat the very purpose of the ETS Review. We need to redesign the NZ ETS and complementary policies such that gross emissions reductions *and* high-quality, durable removals (particularly from 2050) are incentivised as *both* are needed.

Chapters 6 and 7 - Options analysis

Separation of incentives critical (Option 4)

4.50 It is clear that the only way to drive gross emissions reductions *and* removals is to ensure these are strongly but *separately* incentivised, as proposed in Option 4. This presents a large departure from the current ETS architecture and involves the most complexity in terms of implementation, but conceptually is the right thing to do.

4.51 To do this effectively, however, clear targets and appropriately calibrated (and independently assessed) incentives for each will be needed.

[69] Discussion Document, at 48.
[70] Discussion Document, at 49.

4.52 Additionally, and recognising that removals from forestry take time to generate (particularly indigenous), the Climate Change Commission has identified the need for clear direction on, and objectives for, the role of forests in Aotearoa New Zealand, including the amount and type of forestry required to meet the 2050 target,[71] our nationally determined contributions, and our obligation under the Paris Agreement to be net-negative beyond 2050. Defining how (and what type of) forestry will contribute to environmental, economic, social, cultural and climate resilience objectives is essential for designing policies to deliver optimal outcomes.[72]

4.53 To this end, we support the proposed development of a "carbon removals strategy" that will set out:[73]

(a) How many removals we need to complement ambitious gross emissions reductions;
(b) What types of removals should be prioritised, including with regard to how biodiversity, climate resilience and broader co-benefits could be realised simultaneously; and
(c) How new removal activities can be recognised and rewarded over time.

This strategy should support the first Emissions Reduction Plan's stated prioritisation of nature-based solutions that address climate change and biodiversity loss in tandem.

4.54 The temporal horizons in respect of which incentives for removals are designed should be multi-generational, ensuring that not only are short to mid-term targets met, but that a long-term and enduring carbon sink is in place by and beyond 2050.

4.55 They should also be designed in accordance with best-practice international environmental integrity standards and optimising broader nature-positive co-benefits. This will favour indigenous reforestation and restoration, as well as the restoration and protection of other land-based and marine carbon sinks.

4.56 The strength of incentives for removals will be important to realise their desired objectives and outcomes. How this might be achieved is not explored in the Discussion Document, but will obviously be a critical consideration for the development of an effective biodiversity credit scheme, which is the subject of a separate but interrelated consultation.

Existing levers will also be important (Option 1)

4.57 The Government's ability to control auction unit supply and the price corridor within which these are auctioned (existing levers) can help drive gross emissions reductions. But it can only do this effectively with the removal of (or significant constraints on the generation, accounting of, or access to) forestry units, and a clear and stable commitment to a 1.5°C-aligned glide path.

[71] Climate Change Commission 2023 Draft Advice, at 126.
[72] Climate Change Commission 2023 Draft Advice, at 129.
[73] Discussion Document, at 74.

4.58 The Government's December 2022 decision on unit limits and price control settings were at odds with expectations set in the first Emissions Reduction Plan that the NZ ETS would deliver gross emissions reductions[74]. Procedural flaws that underpinned this decision were successfully challenged by LCANZI, but the impacts on market confidence and associated delays on investment decisions, have hindered progress in the interim. It is critical that these levers are deployed in support of a 1.5°C-aligned target, not selectively with unintended (but foreseeable) consequences.

4.59 The justification for, and current industrial free allocation settings, should also be revisited, which the Climate Change Commission states are disproportionate to the risk of emissions leakage[75] and "inconsistent with the NZ ETS incentivising net zero long lived gases emissions by 2050."[76]

Demand for removals: The Government will need to purchase removals to meet our NDCs (variation of Option 2)

4.60 In addition to Options 4 and 1, we further agree that demand for removals will need to be assured to ensure there is sufficient and sustained support for investment in high quality removals. Such demand could derive from:

(a) Meeting our nationally determined contributions by prioritising domestic mitigation, including long-term carbon sinks;
(b) The Government's Carbon Neutral Government Programme; and
(c) The development of a domestic voluntary carbon market.

4.61 If carefully incentivised in accordance with international best practice for environmental integrity (which would favour indigenous reforestation), we expect there could also be international demand for premium New Zealand removals for long-term drawdown of emissions overshoot (i.e. not as an "offset" to international fossil fuel emissions). The "carbon removals strategy" should be designed with this possibility in mind.

4.62 As a transitional measure in support of Option 4, emitter access to forestry removals in the ETS could be increasingly restricted and ultimately phased out (Option 3) to allow for a smoother transition from the status quo. This would, however, need to be carefully calibrated so as not to frustrate the purpose and effect of moving to a separate incentives model.

Co-benefits: Differentiating incentives according to quality of removals (variation of Option 3)

4.63 Option 3 canvasses the idea of discounting or awarding fewer forestry units if forestry removals remained in the NZ ETS. There would need to be a clear rationale and

[74] Climate Change Commission 2023 Draft Advice, at 56.
[75] Climate Change Commission 2023 Draft Advice, at 9, 69.
[76] Climate Change Commission 2023 Draft Advice, at 68.

methodology for this approach informed by, and differentiated according to, considerations of equivalence, permanence (or durability) and co-benefits.

4.64 Restrictions on the proportion of forestry units emitters can surrender could be feasible at low levels without corrupting the emissions cap. But this would require additional support for forestry removals outside the NZ ETS, with the risk of differential pricing (and associated inequities) and complexities of multiple systems.

4.65 However, Option 3 introduces the concept of changing the incentives for removals. A variation or more nuanced version of this approach, which is considered in Chapter 7, is to differentiate incentives for removals according to a suite of desired outcomes in addition to sequestration, including broader ecological co-benefits. We fully support this approach.

4.66 We disagree, however, with the Discussion Document's reductionist concern that "prioritising removals with co-benefits may not be the most cost-effective way to reduce net emissions" and to this end invites feedback on "the extent to which … co-benefits should be prioritised over emissions." The first Emissions Reduction Plan was clear that the Government would prioritise nature-based solutions to address the climate and biodiversity crises together and, in support of this, would "investigate how to best ensure that a biodiversity lens is applied to climate change policy development and planning."[77] It is critical, therefore, that the pursuit of broader ecological benefits and climate resilience are not traded off against enduring sequestration. Both must be achieved.

5 Transitional considerations

5.1 The effectiveness of the NZ ETS relies on clear direction from Government on long term goals and objectives, and commitment to a policy framework to deliver these. To restore a degree of certainty and therefore market confidence, we encourage Government to communicate some 'in-principle' decisions regarding the direction of ETS reforms as soon as possible, and consider whether the deployment of transitional measures to ensure incentives and decision-making in the interim supports the direction of change. This means ensuring strong incentives in the short term both for gross emissions reductions and for investment in long-term native reforestation, while policies are finalised and legislation updated.

5.2 The Discussion Document acknowledges the cumulative effect of delays in terms of costs (to change and increased climate risks/adaptation) and effects. Policy design and implementation need to be commensurate with the climate emergency we have declared and that is in evidence worldwide. The next 18-24 months cannot be a period of further delay and market uncertainty, especially given long lead times for forestry investment decisions and their realisation in terms of sequestration and co-benefits.

[77] First Emissions Reduction Plan, at 89. This is also consistent with *Te Mana o te Taiao* and targets under the Kunming-Montreal Global Biodiversity Framework, which Aotearoa New Zealand has adopted as a party to the Convention on Biological Diversity.

5.3 It is unclear what the impacts of recent market uncertainty have been in terms of delayed action on emissions and investment in forestry, and reform decisions will need to adequately account and correct for these.

5.4 We agree that the stockpile may also limit or delay the effectiveness of reforms options.[78] This too will need to be adequately accounted and compensated for.

5.5 *Te Tiriti* implications and the extent, and therefore effect, of grandparenting (for units already issued or for forests already registered in the ETS) for existing investors (whether Māori or not) will also need to be clearly understood as this will determine the effectiveness of any reforms to drive gross emissions reductions and the establishment of optimal long-term carbon sinks, and the timeframes within which its successfulness will be realised.

5.6 The perceived fairness of a policy outcome that creates separate incentives for gross reductions and forestry will depend on the implementation, in respect of which there is insufficient detail to comment. However, it is unreasonable and impractical to expect the NZ ETS to solve everything and its integrity should not be unduly complicated by shoe-horning in issues that are better addressed outside the scheme's design parameters.

5.7 There are viable pathways outside the NZ ETS to resolve or mitigate concerns in relation to preserving or improving land productivity, including through separate compensation where appropriate, together with opportunities to make indigenous reforestation and restoration comparably attractive (vis-à-vis exotic afforestation) (including by way of biodiversity payments, and Jobs for Nature support).

6 Concluding remarks

6.1 Reform of the NZ ETS is critical and urgent.

6.2 Its redesign must prioritise gross emissions reductions as well as supporting indigenous reforestation and restoration for durable, long term, nature-positive carbon sequestration and storage. This necessitates separating the incentives for each, with both being independently compelling.

6.3 A concerted effort and innovative approaches to strengthen the incentives for permanent indigenous reforestation is needed but is possible through:

(a) Increased demand under the Government's carbon neutral programme and to meet Aotearoa New Zealand's domestic and international[79] targets;
(b) The qualitative differentiation of forestry removals (with regard to environmental integrity and co-benefits);
(c) Restricting the permanent forest category to indigenous forests;

[78] Discussion Document, at 19.
[79] Which assumes that the cost of incentivising domestic abatement will be cheaper than purchasing offshore units: Climate Change Commission's 2023 Draft Advice, at 54.

(d) The formalisation of a voluntary carbon market;
(e) Anticipated international demand for premium offsets;
(f) Increased auction revenue; and
(g) Introducing a credible biodiversity credit scheme.

6.4 Importantly, reform of the NZ ETS should not be constrained by a lack of legislative ambition (and, seemingly, obligation) to align our domestic targets (and policies to meet them), with a 1.5°C-compatible future, nor the failure of our domestic efforts and international commitments to properly reflect our "fair share".

6.5 Preserving (or indeed restoring) our reputational credibility, fulfilling our duties to protect future generations, and taking actions commensurate with the existential threat and global emergency that climate change presents behoves us to do much more, urgently.

6.6 We look forward to engaging further to ensure that the reform options pursued will see to it that we do.

Submission on the proposed redesign of the Emissions Trading Scheme, 2023

Submitter: Professor Euan G. Mason

Profile: Dr Euan Mason is a Professor at the New Zealand School of Forestry, University of Canterbury, where he teaches silviculture, statistics, modelling, and research methodology. His research interests include forest growth and yield modelling, tree physiology, and silviculture. He has published numerous peer-reviewed articles and a chapter in a textbook relating to climate change and forestry, and has been employed by government ministries and political parties to advise them on climate change issues from time to time. He is a New Zealand citizen, born in Invercargill. He was educated at universities in New Zealand and the United States of America.

Synopsis of submission

I provide a summary of our current state and the role of forestry in helping New Zealand respond appropriately to climate change.

Many proposed changes to the emissions trading scheme (ETS), particularly the idea of splitting credits into sequestered carbon versus avoided emissions with only the latter of any market value, are irrational, will create confusion, will lower confidence in carbon forestry, and will cause us to fail to meet our targets. This will cost the nation potentially billions of dollars in purchases foreign carbon credits of dubious quality, and in lost markets as other countries begin to sanction our lack of action.

Continued expansion of forests, particularly exotic ones, is vital for us to reach our national targets.

Unharvested exotic carbon forests could be assured of ultimate conversion to native by:

a. Carefully selecting sites on which these forests are established,
b. Requiring owners of such forests to place a portion of their carbon credit revenues in an escrow account to pay for any management required for their conversion.

More accurate assessments of sequestration on small woodlots would encourage farmers to establish carbon forests on small portions of their farms and reduce the likelihood of whole-farm conversions to forest that are currently causing such anguish in the agricultural sector.

Our emissions trading scheme ignores those responsible for more than half of our gross GHG emissions.

The “emissions leakage” argument used to exempt most greenhouse gas (GHG) emitters from the ETS does not work, because it requires us to assume that:

a. We are the most greenhouse gas (GHG)-efficient producers of primary products
b. Other countries will not seek lower their GHG emissions;
c. People will continue to purchase goods with a high greenhouse gas footprint as the climate crisis worsens.

Moreover, actual studies of emissions leakage show that it is a negligible problem. Therefore the NZ agricultural sector and other trade-exposed industries, responsible for 57.5% of our gross GHG emissions, should not use the “leakage argument” as a justification for their exemption from purchasing NZUs.

The discussion document suggesting changes to the ETS fails to make the case that forest-based carbon credits threaten reductions in gross GHG emissions by overwhelming the carbon market with cheap credits. This case relies on the assumption that the supply of credits will increase while the demand for credits will remain small. However, making trade-exposed industries and agriculture responsible for their emissions would greatly increase the demand for credits, invalidating the argument that forest-based credits necessarily threaten reductions in gross emissions.

The pathway to lowering gross emissions is to:

a. Require everyone, including farmers and trade-exposed industries to submit credits for the full amount of their greenhouse gas emissions;
b. Allow the price of carbon credits to rise to the point where it is more cost-effective to lower emissions that to purchase offsets;
c. Stop auctioning carbon credits;
d. Stop giving away credits.

The threat of carbon forestry to our high country farming culture can be mitigated by making carbon lookup tables accurate and/or allowing owners of carbon forests < 100 ha in extent to measure actual carbon sequestration in their woodlots. This would encourage farmers to establish their own small woodlots, reducing the incentive to convert whole farms to forest and greatly increasing the profitability of hill country farms.

Background

Aotearoa has so far failed to make substantial progress in its response to climate change, and proposed changes to rules for permanent forest carbon sinks will further undermine progress in meeting our net GHG emission commitments for 2030 and 2050. That our nation is one of the worst greenhouse gas polluters is beyond doubt. Climate Action Tracker provides an assessment of our performance and rates it as highly insufficient (Figure 1).

According to our Ministry for the Environment, Aotearoa emits about 78 million tonnes of CO_2-e annually . These are known as "gross emissions". In 2018 we emitted 16.9 tonnes of CO_2-e per capita. This level of emissions placed us 16th worst among all countries[1], and is far above both the Organisation for Economic Cooperation and Development average of 10.83 and the global average of 6.45 tonnes of CO_2-e per capita[2].

Aotearoa has agreed to two international commitments. Firstly, we have agreed to a "Nationally Determined Contribution (NDC) to keep our *net* GHG emissions at 50% of *gross* 2005 emission levels between 2021 and 2030. Secondly, and more importantly, we have pledged to get our net emissions down to zero by 2050, with perhaps some exceptions for methane emissions from agriculture.

Recent progress has been made by setting up a Climate Change Commission, providing incentives to purchase electric vehicles, and attempting to negotiate with farming lobbyists. In addition an emissions trading scheme has been set up so that for a bit less than half the country's emitters there is a price on greenhouse gas emissions. The price recently rose to as high as $85/tonne of CO_2, leading to some investment in carbon (C) forestry, among other things, and some concern from hill country farmers about whole-farm conversions to C forestry. Conversion of whole, mostly hill

[1] https://en.wikipedia.org/wiki/List_of_countries_by_greenhouse_gas_emissions_per_person
[2] https://www.climatewatchdata.org/ghg-emissions?breakBy=regions&calculation=PER_CAPITA&end_year=2018&regions=G20%2CWORLD%2COECD&start_year=1990

country farms, has become a political issue, prompting some lobby groups to push for legal constraints on conversions. Typically these concerns are about impacts of whole-farm C forests on hill country farming as a way of life. The farming lobby has been joined by an anti-exotic species lobby that questions what might happen to exotic C forests that remain unharvested and would much prefer to see indigenous species in C forests.

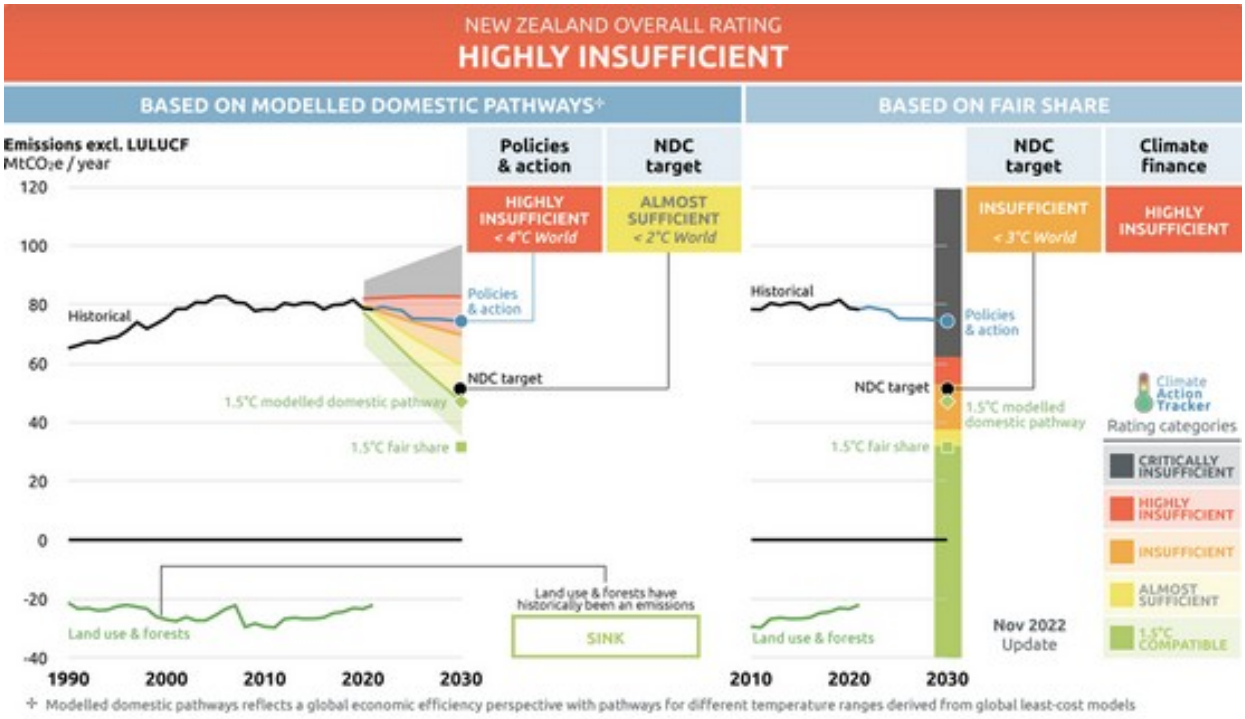

Figure 1 – An assessment of our national performance at climate change mitigation, available on-line at https://climateactiontracker.org/countries/new-zealand/ (Accessed on 14/4/22)

The role of forestry

Creating *new* forests is the most efficient way we currently know of to extract CO_2 from the atmosphere. Trees absorb solar energy and create sugar from CO_2 and water. Some of the created sugar is used to provide energy for living functions, and some is stored for longer periods in biomass. Typically half the dry-weight biomass in wood is elemental C, and amounts of CO_2 extracted from the atmosphere ("sequestered") by trees can be calculated by multiplying the mass of stored elemental C by 44/12.

New forests are called "sinks" for CO_2 because they extract far more CO_2 from the atmosphere than they emit through respiration, but forests do not remain sinks forever. The name "permanent forest sink" can therefore be misleading for those who are unfamiliar with forestry. Eventually forest sinks become simple carbon reservoirs. Those that are repeatedly harvested and re-established typically retain about 60-70% of their maximum C content at harvest in long-term average storage, while unharvested forests eventually reach the point where they are emitting as much CO_2 through respiration and decay of dead biomass as they absorb. Their long-term storage may be punctuated by small- and large-scale disturbances such as wildfires or windthrow that reduce their average long-term storage just as periodic harvesting can reduce average long-term storage.

Establishing new forest sinks to absorb GHGs we emit can only, therefore, be a *temporary solution*, with additional new forest sinks providing a cheap way to extract our GHG emissions from the atmosphere, achieving net GHG neutrality while we develop ways to reduce our gross GHG

emissions to zero. If we wished to rely on forest sinks to achieve GHG neutrality on a permanent basis then we would need an unlimited supply of unforested land on which to establish new forests each year. This fact was clearly recognised by authors of the "Globe" study, a multi-partisan, parliamentary-initiated study designed to explore how Aotearoa could reach GHG net neutrality by 2050 (Vivid_Economics, 2017).

After extensively studying Aotearoa's GHG-emitting and forestry sectors, the authors of the Globe study stated that in their opinion we could not reach net GHG neutrality by 2050 simply by reducing gross GHG emissions to zero because new technologies had to be developed, and resistance to rapid change would be strong. They recommended that new forest sinks be used to fill the gap between what we wished to achieve by 2050 and what could realistically be achieved by gross GHG emission reductions. This situation is clearly shown in a graph that quantifies the gap in our accounts that we need to fill with sequestration of CO_2 by forest sinks while we reduce our gross emissions to zero (Evison & Mason, Forthcoming) (Figure 2).

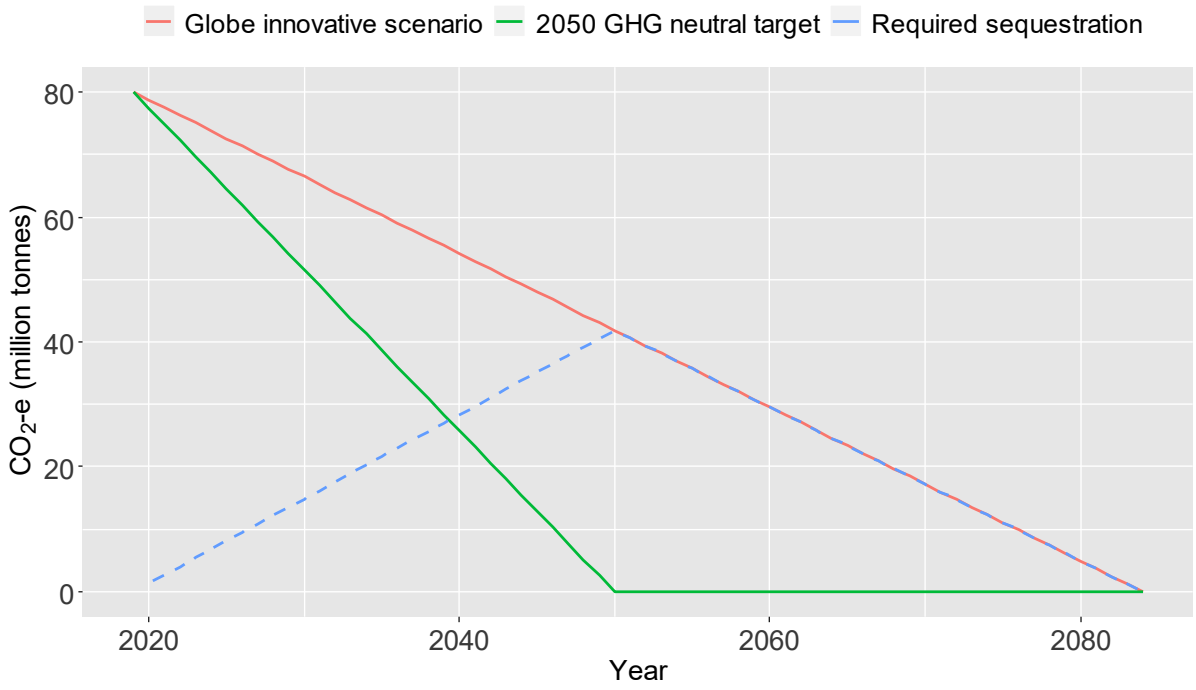

Figure 2 – The Globe study's "Innovative" scenario of gross GHG emission reductions (red), the path Aotearoa has committed itself to for net GHG emissions (green), and the gap in our national C accounts that needs to be filled by forestry (blue dashed line) (Evison & Mason, Forthcoming). The graph and an accompanied analysis of our options will soon be submitted to a peer-reviewed scientific journal.

Reality is a bit more complicated than the situation represented by Figure 2 because we have not consistently planted the same area of new forests in Aotearoa each year. The last large-scale afforestation programme occurred during the 1990s, and many of those forests will be harvested in the 2020s, effectively reducing our carbon storage in forests, and this needs to be taken into account if we wish to genuinely reach net GHG neutrality by 2050. I'll show that later, but for now let's consider what factors influence the rate of CO_2 sequestration/hectare and the maximum amounts of CO_2-e storage in new forest sinks.

C sequestration by forests

Three factors overwhelmingly influence both rates on forest sink sequestration and maximum storage in forest reservoirs. These three factors are:

1. The fertility, soils and climate on sites where the forests are established;
2. The species established on those sites; and
3. The ways that forests are managed. We call this management "silviculture".

Impacts of site are easily illustrated, but are complicated by the fact that, by definition, no forests are currently growing on candidate sites for new sinks. We need to estimate potential productivity by examining the impacts of soils and climate on tree physiology (Figure 3).

Such a map would be subtly different for each tree species, because species differ in their responses to site conditions and pests.

If we ask which sites currently have no forest, and are not prime farmland, i.e.: land use classes 5 and 6, we get a map like that shown in Figure 4.

Rules for the national emissions trading scheme (ETS) specify that forests planted on land that was unforested in 1990 can earn carbon credits called New Zealand Units (NZU). One NZU is meant to represent 1 tonne of CO_2 removed from the atmosphere as trees grow. Land areas larger than 100 ha can be measured at various times and the tonnes of C stored can be estimated. However, if a forest owner's land area is less than 100 ha then they are required to use default "lookup" table for sequestration. For some species, such as radiata pine, the tables vary with region, but for others there is simply one table. Tables tend to be conservative.

There is one lookup table for all native forests, which is a simple Gompertz yield equation based on data from 52 sites that rises to an asymptote of 445 t CO_2-e/ha assuming no water deficit (Payton et al., 2010). Clearly this table has too low an asymptote for many of the indigenous forests quoted in Table 1, and it was intended to be used for young forests established after 1990. Almost all the 52 sites measured contained manuka, kanuka and/or gorse with a few emergent native hardwoods.

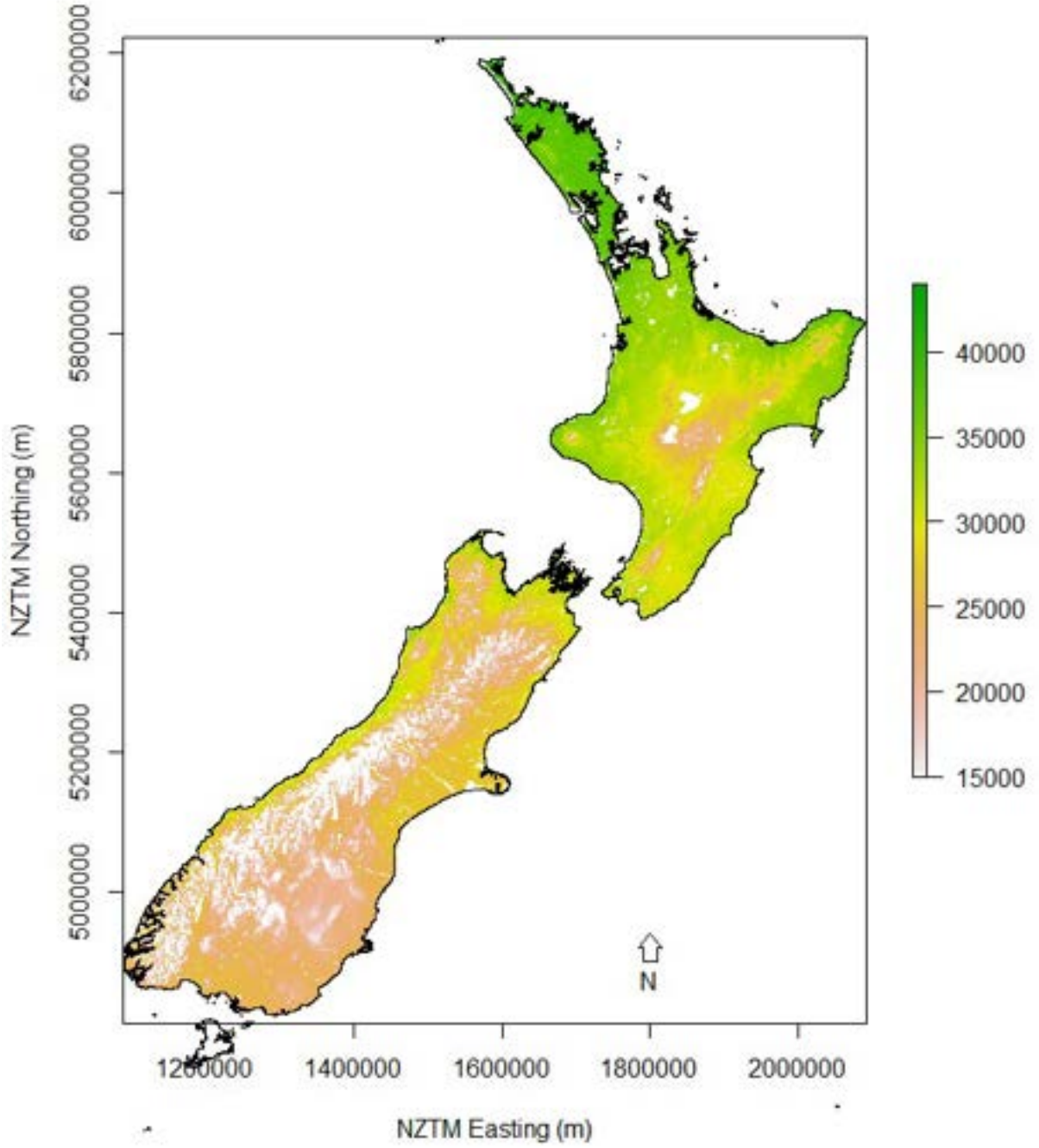

Figure 3 – Megajoules/m^2 of solar radiation (of which ~50% is photosynthetically active) potentially useable by a species like radiata pine over the 10 years between June 2008 and June 2018 across Aotearoa. This geographical information system layer has approximately 3 million pixels, each representing 9 ha. Green = more productive, and white = unsuitable. Scales are NZTM eastings and northings.

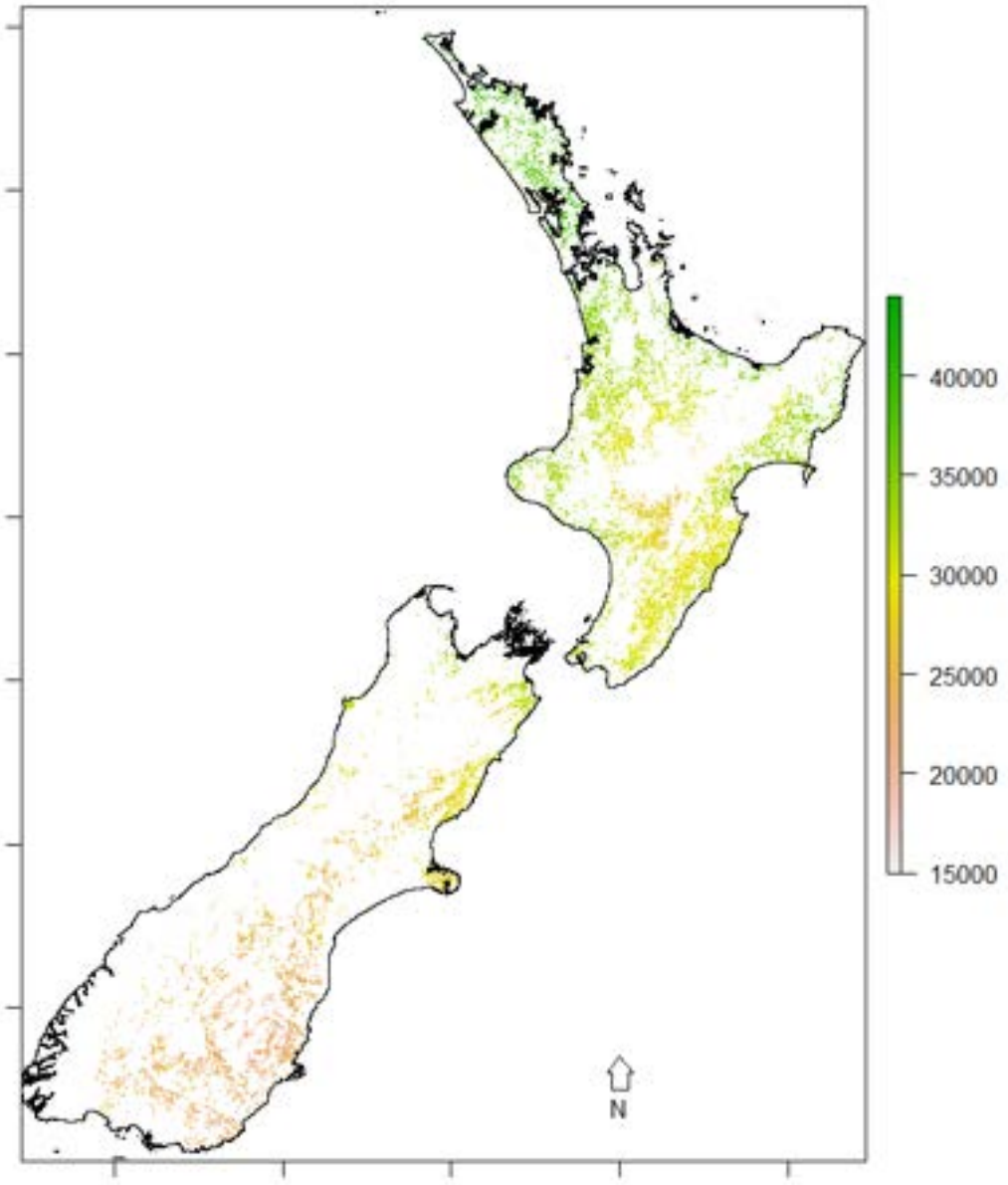

Figure 4 – Areas in land use classes 5 and 6 that are currently unforested, coloured by likely productivity as shown in Figure 3.

Estimates of forest CO_2 sequestration rates and storage per hectare vary widely (Table 1).

Table 1 – Example carbon dioxide sequestration rates and storage by forests in Aotearoa. The first 10 entries were in natural stands, while the other examples were in plantations. In some cases below-ground C was considered while in others it was not.

Land cover	**Sequestration t CO_2/ha/year**	**Storage t CO_2/ha**	**Below ground?**	**Reference**
Native forest average (from national vegetation survey)		525	No	(Hall, 2001)
Native woody scrub		128	No	(Tate et al., 1997)
Manuka/kanuka shrub, ~25 years	10	238	No	(Scott et al., 2000)
Manuka/kanuka shrub, ~35-55 years		554	No	(Scott et al., 2000)
Manuka/kanuka shrub, 40 year span	7-9		Yes	(Trotter et al., 2005)
Lowland native podocarp-broadleaf forest		1238	No	(Tate et al., 1997)
Mature beech-podocarp forest		1287	No	(Beets, 1980)
Mature beech-podocarp forest		1290	No	(Tate et al., 1997)
Hard beech forest		1172	No	(Tate et al., 1997)
Mountain beech forest		938	No	(Tate et al., 1997)
Kauri, Northland, aged 67, 492 stems/ha	13.8	926		(Kimberley et al., 2014)
Kauri, Fred Cowling Reserve, aged 38, 1402 stems/ha	10.9	413		(Kimberley et al., 2014)
Kauri, Fred Cowling Reserve, aged 51, 11256 stems/ha	12	614		(Kimberley et al., 2014)
Kauri, Fred Cowling Reserve, aged 69, 1325 stems/ha	18.9	1306		(Kimberley et al., 2014)
Kauri, Taranaki, Brooklands Park, aged 50, 630 stems/ha	13.3	663		(Kimberley et al., 2014)
Kauri, Taranaki, Brooklands Park, aged 71, 630 stems/ha	14.5	1027		(Kimberley et al., 2014)
Kauri, Taranaki, Brooklands Park, aged 83, 630 stems/ha	13.4	1116		(Kimberley et al., 2014)
Kauri, Hawkes Bay, aged 48, 1700 stems/ha	20.1	966		(Kimberley et al., 2014)
Kauri, Northland, aged 36, 650 stems/ha	10.9	393		(Kimberley et al., 2014)
Totara, Northland, aged 102, 1225 stems/ha	17.4	1770		(Kimberley et al., 2014)
Totara, Northland, aged 102, 1825 stems/ha	13.3	1357		(Kimberley et al., 2014)
Totara, Northland, aged 58, 816 stems/ha	6.5	376		(Kimberley et al., 2014)
Totara, Hawkes Bay, aged 48, 1975 stems/ha	8	382		(Kimberley et al., 2014)
Totara, Waikato, aged 30, 2831 stems/ha	6.1	182		(Kimberley et al., 2014)
Kahikatea, Waikato, aged 30, 2831 stems/ha	9.6	289		(Kimberley et al., 2014)
Puriri, Bay of Plenty, aged 69, 588 stems/ha	15.2	1046		(Kimberley et al., 2014)

Red Beech, Waikato, aged 16, 738 stems/ha	9.2	147		(Kimberley et al., 2014)
Red Beech, Southland, aged 14, 1579 stems/ha	6.2	87		(Kimberley et al., 2014)
Black beech, Southland, aged 14, 1508 stems/ha	7	98		(Kimberley et al., 2014)
Pasture without grazing		11	Yes	(Ford-Robertson et al., 1999)
Pruned radiata pine on a good site, 400 stems/ha (modelled), average over three 28 year rotations		814	Yes	(Ford-Robertson et al., 1999)
Pruned radiata pine on a poor site, 250 stems/ha (modelled), average over three 28 year rotations		550	Yes	(Ford-Robertson et al., 1999)
Pruned radiata pine, 250 stems/ha to age 28 Central North Island (modelled)	33	918	Yes	(Robertson et al., 2004)
Untended radiata pine, aged 15, 2500 stems/ha, site index=23	38	571	Yes	(Yallop, 2021)
Untended radiata pine, aged 15, 1250 stems/ha, site index=23	34	514	Yes	(Yallop, 2021)
Untended radiata pine, aged 15, 625 stems/ha, site index=23	27	401	Yes	(Yallop, 2021)

Paula Yarur Thys (2021) measured C storage in planted native forest stands on Banks Peninsula, Canterbury up to 59 years after planting, and compared their C storage to those estimated by the lookup table assuming a water deficit (Figure 5). She found that data were highly variable, that they more or less agreed with the lookup table for young stands, but older stands had C storage exceeding that shown in the table. Moreover, a nationwide survey by Beets et al. (2009) demonstrated that many natural stands exceeded the asymptote in the lookup table (Figure 6).

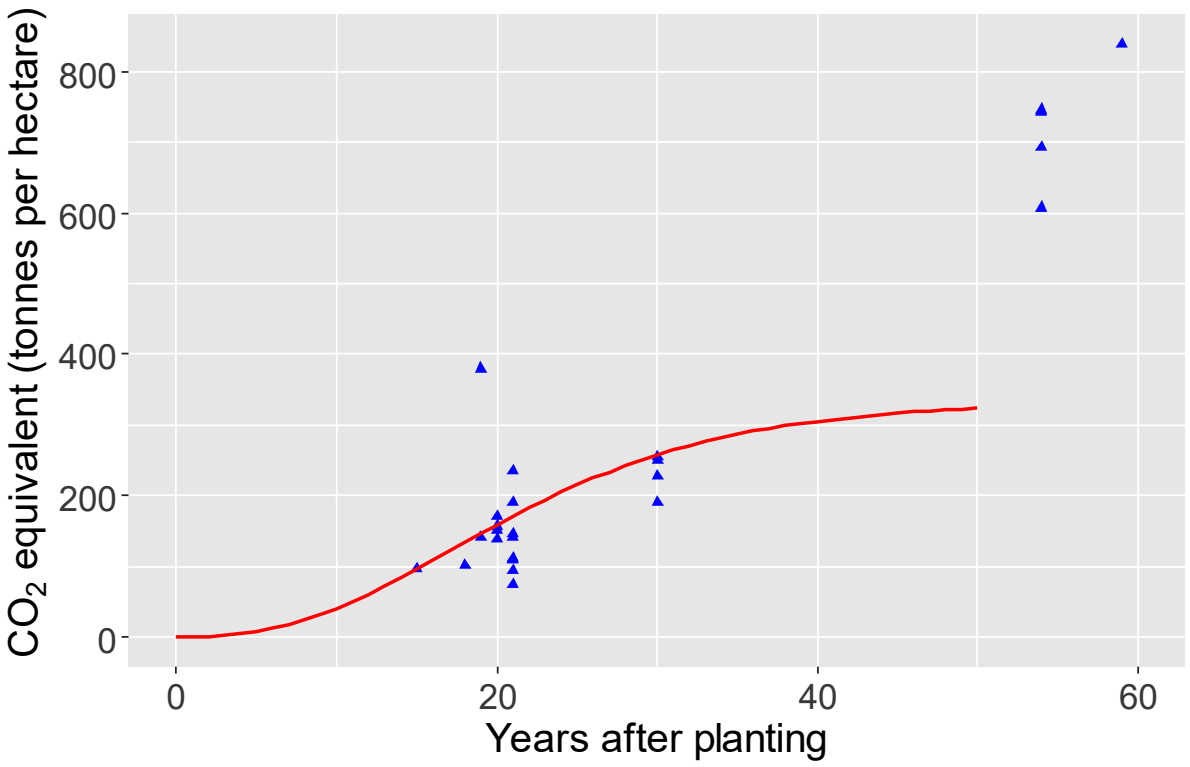

Figure 5 – Measured CO2-e storage (blue triangles) versus age, and the Ministry for Primary Industry's carbon sequestration lookup table for native forests on dry sites in Canterbury (red line).

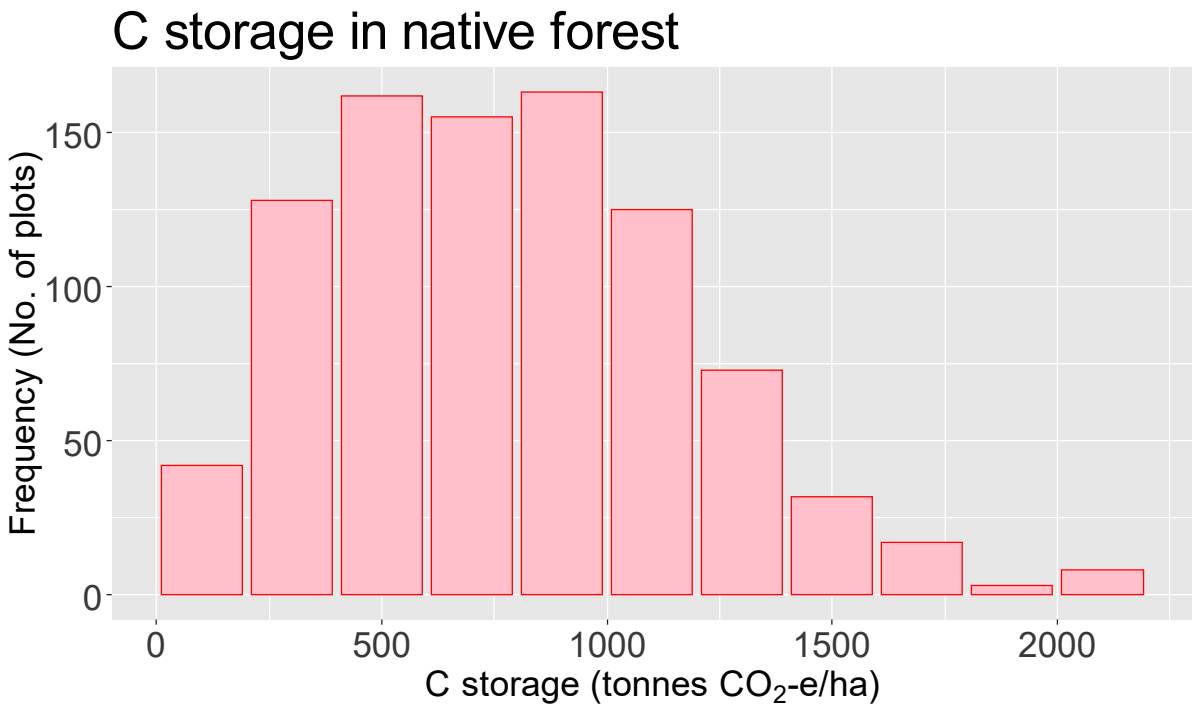

Figure 6 – C storage in Aotearoa's native forests estimated by Beets et al. (2009)

Kimberley et al. (2021) reported some new observations of sequestration rates in plantations of native species, including a number from Kimberley et al. (2014), but some from 2014 appear to be missing from the 2021 graph and so I have added them (Figure 7). Some of the implied sequestration rates they found are quite high for native species, and so this is encouraging. However, as sequestration rates vary also with site and stand management, I asked where their plots were in the landscape and how the stands were managed. Mark Kimberley replied, "They are scattered across the country, more in the North Island than South Island." He also assured me that full details will be provided when a paper is prepared for peer review. If these plots were repeatedly measured then families of curves might be fitted in order to represent sequestration rates and carbon storage on a wide range of sites and stand management practices. It is difficult to judge how the reported rates might apply across the range of sites available for carbon forestry in the absence of detailed plot information, and repeated measures would provide us with a more realistic appraisal of variation in sequestration rates. For reference, on a roughly average site (site index=32 m in the central North Island) radiata pine planted at 800 stems/ha and then thinned to 500 stems/ha can reach 1000 tonnes CO_2-e/ha in about 25 years.

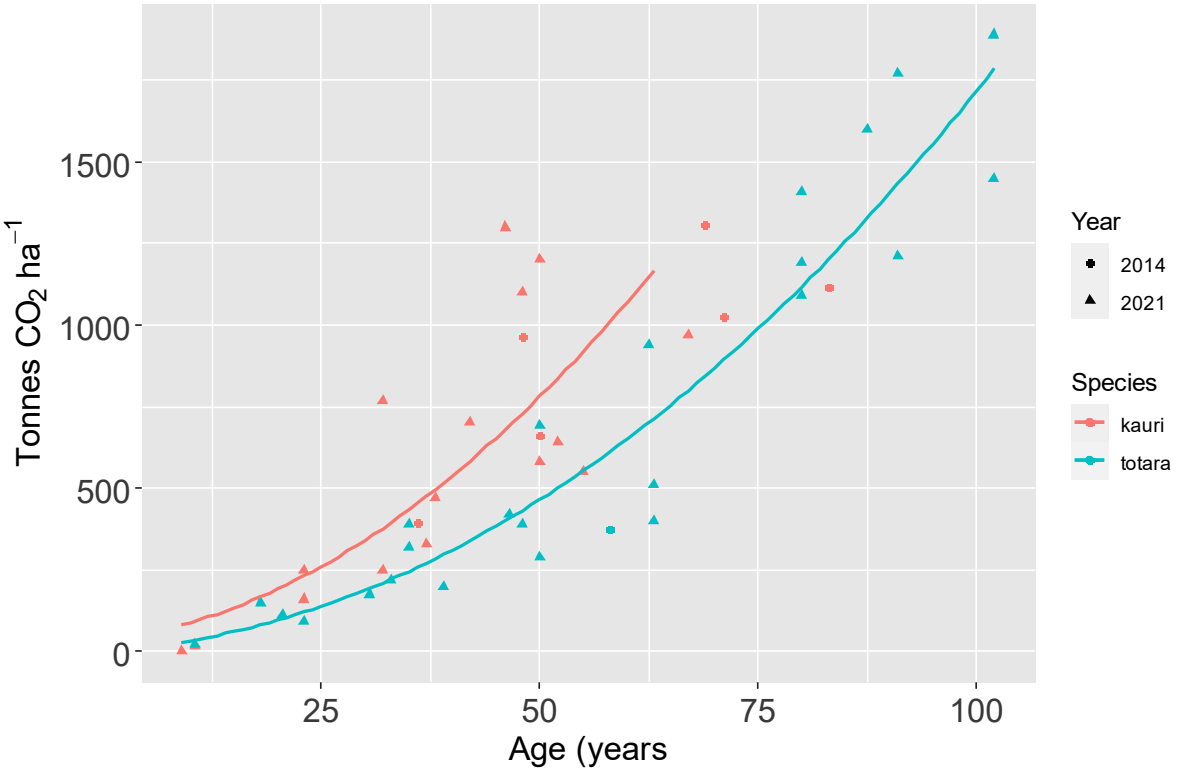

Figure 7 – Estimates of CO2-e storage in kauri and totara plantations on a range of sites at a range of stems/ha Kimberley et al. (2021) (triangles) and some extra points from Kimberley et al. (2014) (circles). Lines are fitted to the 2021 data.

Radiata pine sequestration rates can be estimated by using growth and yield models of stem dimensions combined with a carbon estimation model called C_CHANGE (Beets et al., 1999) or by applying individual tree biomass models (Moore, 2010) to stem measurements in tree lists from inventories. Thousands of permanent sample plots are available for the construction of growth and yield models, and thousands of inventory plots are established in Aotearoa's plantations each year. A small number of very large trees have been assessed for biomass, however, which limits the applicability of C_CHANGE and Moore's biomass models. Growth and yield measurements of stems are more sparse for other species, and comprehensive biomass data are rarely available.

Lookup tables for exotic species may greatly underestimate actual sequestration and storage. A study undertaken in a 7.5 ha experiment at Rolleston, Canterbury, across a range of stems/ha, combined with destructive harvesting of 476 local trees for biomass estimation showed that the Canterbury lookup table underestimated CO_2 sequestration of radiata pine by up to 63% (Yallop, 2021) (Figure 8). For reference, this site has a very low site index of 23, and site indices over 40 have been recorded in other parts of Aotearoa. A study at the School of Forestry, University of Canterbury, examined how assessed sequestration rates compared with lookup table rates on a wider range of sites and with a wider range of stand management practices and found that lookup tables frequently under-estimated our best estimates of actual sequestration (Nish, 2022).

Figure 8 – C sequestration and storage by radiata pine over 15 years at 2500, 1250, and 625 stems/ha and with two levels of weed competition control: 2 years (N) versus 4 years (H) on a poor site in Canterbury (Site index=23) compared to the Ministry for Primary Industry's default carbon sequestration lookup table for Canterbury (in purple) (Yallop, 2021).

In summary, forest sequestration rates and carbon storage vary with site quality, species, and stand management. Sequestration rates in highly stocked stands of some native species on highly productive sites might approach 2/3 of those observed in radiata pine stands at lower stockings on average sites, but in many cases sequestration rates and maximum storage of C in native forests appears to be much lower than that achieved by our most rapidly-growing exotics. Moreover, native plantations appear to take longer to reach their highest rates of sequestration. Lookup tables for exotic species may be very conservative, and those for native forests need to be more diverse, reflecting the wide range of sequestration rates and storage values recorded in plots. The lookup table for natives may be roughly right for some shrubs such as manuka & kanuka or young stands of trees, but the level of maximum storage (the asymptote) clearly underestimates what has been observed in some older, high forest stands.

The case for exotic tree species

Many imported species grow and sequester CO_2 much more rapidly than native species within the time frames required to meet our 2050 target. Radiata pine has been chosen as an example for the following reasons (although other species such as dryland eucalypts or redwoods might do the job equally well or even better in some cases):

1) It grows rapidly and sequesters C at a much higher rate than native species. Between 2008 and 2012, our national carbon accounts indicate that radiata pine planted after 1990 sequestered at an average rate of 34 tonnes of CO_2-e/ha/year, and rates might be even higher with silvicultural regimes aimed at maximising value from sequestered carbon credits. By contrast, estimated rates of sequestration for native species are often below 10 tonnes of CO_2-e/ha/year during the years immediately following forest establishment (Scott et al., 2000; Trotter et al., 2005), and the slower development of young native stands would mean that they would take longer to begin effective sequestration. In older indigenous stand higher rates have been reported on some sites, but not at the rates typical of radiata pine. To be fair, studies of native forest sequestration are sparse, as outlined in the previous section, but we can also get an idea of relative sequestration rates by comparing the more numerous reports of growth rates of stems of various species (Pardy et al., 1992; Silvester & McGowan, 1999), and native species often take 3-4 times longer to reach equivalent stem volumes of radiata pine plantations at harvest even at higher stockings.
2) We are experts at producing seedlings for exotic species and they are cheap.
3) Radiata pine will grow on a wide range of sites and we understand how to establish it on diverse sites, despite its sensitivity to shade and frost.
4) Radiata pine is not a high country wilding risk (Ledgard, 2008). It is very intolerant of both shade and frost, and would only seed naturally on moist lowland areas (Dickson et al., 2000) where adjacent land was not intensively grazed (Beneke, 1967; Douglas, 1970; Ledgard, 1994) (which is a relatively rare condition in New Zealand). Our wilding species are commonly other, more hardy imports, such a *P. contorta, P. ponderosa, P. nigra* and Douglas fir (Ledgard, 1994, 2001; Ledgard, 2008). These wilding risk species should be avoided in carbon forests. Relative to these other species and areas of plantation, radiata pine is only rarely a wilding, and this is on lowland, ungrazed sites.
5) On warm, moist sites (either medium or high productivity categories), exotics can act as a nurse crop for native forest, and the C reservoirs we establish would ultimately change to become native forest so long as seed sources were available in the local vicinity (Figure 9). Understoreys of native vegetation are common in plantations on such sites (Brockerhoff et al., 2003; Ogden et al., 1997). This issue has been much studied by a PhD graduate from the School of forestry named Adam Forbes (Forbes et al., 2015a, 2015b, 2016). In order for native forest to regenerate under pines local native seed sources are essential.
6) Studies suggest that radiata pine will continue to sequester carbon for at least 100 years on some sites (Woollons & Manley, 2012). This means that exotic forests could remain as sinks for some considerable time.

Afforestation with exotics and conversion to native forest

I love our ngahere, and I would be delighted to be able to recommend that all our carbon forests should comprise native species, but unfortunately afforestation with native species is very expensive, and the sequestration rates of native species are not only lower than those of cheap exotics, but they take decades longer to reach appreciable rates even on some of the best sites and at high stockings (Figure 7 and Table 1).

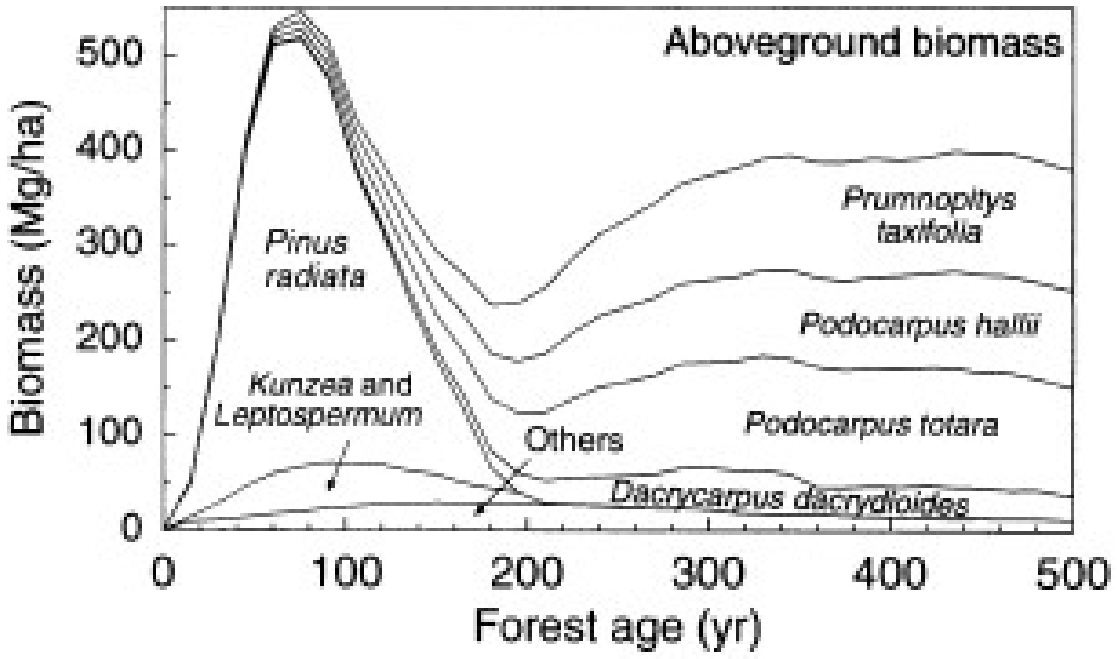

Figure 9 - Forest biomass dynamics after introducing the exotic pine species *Pinus radiata* to the native species pool. Dynamics are modeled for a site near Christchurch, New Zealand. Species aboveground biomass is cumulative. "*Kunzea* and *Leptospermum*" include the early colonizing species *K. ericoides* and *L. scoparium*. "Others" include the species *Griselinia lit- toralis, Pittosporum eugenioides, Aristotelia serrata, Elaeocarpus hookerianus, Fuchsia ex- corticata, Nothofagus fusca*, and *N. solandri var. solandri* Figure from Hall (2001).

Most of our imported, exotic forest plantation species are pioneer species, intolerant of shade, and although they can be regenerated under a canopy, the canopy needs to be exceptionally sparse before any appreciable amount of regeneration to occur. Figure 10 shows how sparse the canopy was after an attempt at continuous cover forestry with radiata pine in the foothills of Canterbury.

It therefore makes sense to consider the option of planting exotics in permanent C forests and then converting them to native forests once the exotics have completed their task of filling the gap in our national C accounts that is critical over the next few decades.

Establishment of native species in some areas of our exotic plantation forests occurs with no intervention as a transition from mostly exotic weeds in young stands to increasingly native species in old stands (Brockerhoff et al., 2003; Ogden et al., 1997), but as noted by Forbes & Norton (2021), this process is not guaranteed to occur in all stands. Proximity to seed sources, extent of small scale

disturbance, lack of a moisture deficit and fertility may all promote an indigenous understorey (Figure 11).

Figure 10 – An attempt at continuous cover forest regeneration using radiata pine at Woodside Forest, Canterbury. Natural regeneration was achieved when the overstorey canopy had been reduced enough through harvesting to allow a light-demanding species to prosper.

Figure 11 – A radiata pine stand in Maramarua Forest was a nurse crop for a vigorous native understorey on the lower slopes where fertility was high (left), but lacked an understorey on a less fertile hill top (right).

Figure 12 – Regeneration of native understorey under a mixed species overstorey at Milnthorpe Park, Golden Bay. Much of the regeneration is natural, but in some cases podocarps have been deliberately planted.

Figure 13 – Natural regeneration and planted natives under an exotic plantation (Credit: Dr Adam Forbes)

Figure 14 – A canopy gap in a highly stocked radiata pine plantation created to initiate natural regeneration (Credit: Dr Adam Forbes)

Figure 15 – Regeneration in a created canopy gap (Credit: Dr Adam Forbes)

Figure 16 – A mixed stand of exotics and a vigorous native understorey (Credit: Dr Adam Forbes)

Figure 17 – Native plants growing under a radiata pine stand (Credit: Jeff Tombleson)

Figure 18 – Native plants growing under a mature radiata pine overstorey at low elevation in the Bay of Plenty

There are several examples of stands in transition from exotic species to native species (Forbes et al., 2015a, 2015b, 2016). In some cases these stands required intervention, such as the creation of gaps, or even direct planting of native species. Moreover, pest control and long-term monitoring are vital.

For examples of where native forest regeneration under exotics has been initiated, see Figures 12-15. Figures 16-18 show examples where native vegetation has naturally regenerated under exotic canopies. Figure 19, from Brockerhoff et al. (2001), shows general trends in composition under repeatedly harvested pine canopies on warm, wet sites.

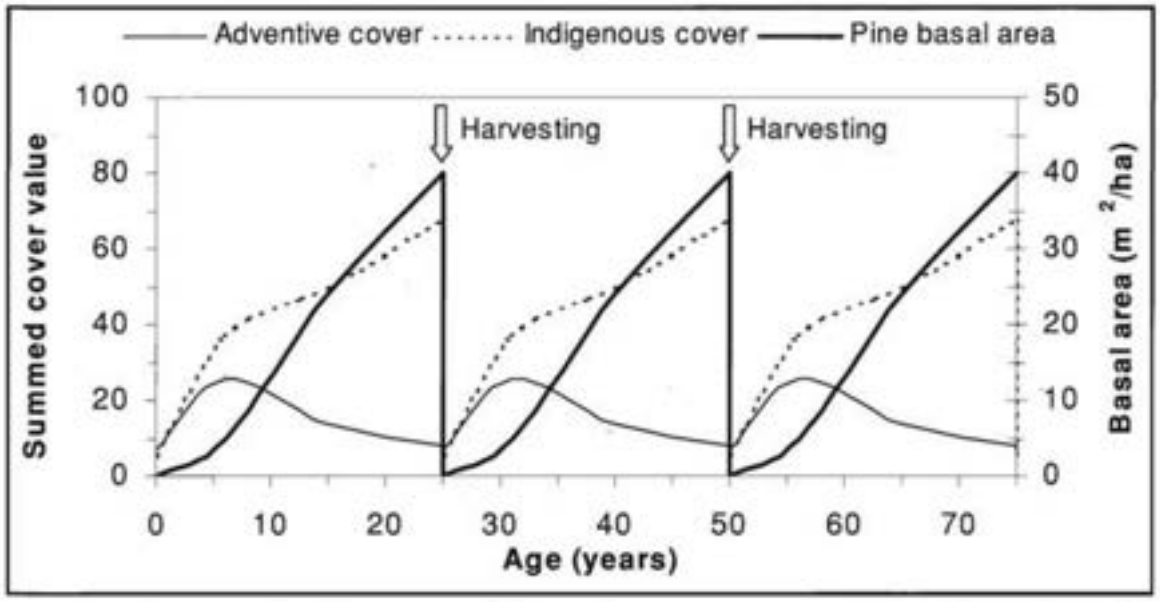

Figure 19 – Trends in biodiversity in repeatedly harvested radiata pine plantations on warm, wet sites (Brockerhoff et al., 2001)

Regeneration under gorse suggests that in some instances species composition may not be the same as that in stands that would have regenerated under native pioneer species such as manuka and kanuka, according to Forbes & Norton (2021).

Forbes & Norton (2021) recommend adaptive management in order to ensure that the transition takes place, and also outline research that is required should we choose this path.

In summary, transitioning from rapidly-growing exotic C forests to slower-growing indigenous ones is feasible on some, but not all, sites. Warm, wet, fertile sites close to native seed sources are the best prospects, and research is required to more clearly identify where such an approach may be successful. *There should be no such thing as "plant and leave" in any C forest, either exotic or native, and monitoring combined with adaptive management and in some cases a commitment to active intervention to meet long-term objectives should be mandatory. Pest control is vital in all C forests, whether exotic or native.*

Filling the gap in our national C accounts

The proper role of forests in mitigating climate change is to act as sinks while we change our emissions behaviour, thus implementing a planting programme to sequester, on an annual basis, the gap shown in the blue triangle of Figure 2. We have developed software to perform a national

estate-level simulation of sequestration resulting from various planting programmes, assuming that the planting was equally likely to be in any of the LUC classes 6 and 7 areas that were "Kyoto compliant" as shown in Figure 4. In previous versions of this analysis we assumed that the last period of rapid new forest establishment, during the 1990s, was more or less on a long-term average trajectory, with periods of emission at times of harvests followed by periods of sequestration by re-established crops. However, this assumption is a bit unrealistic because the period of rapid expansion in our plantation forest estate lasted little more than a decade, and it was followed by a long period with almost no new afforestation. The effect of this planting programme, compared to required sequestration is shown in Figure 20.

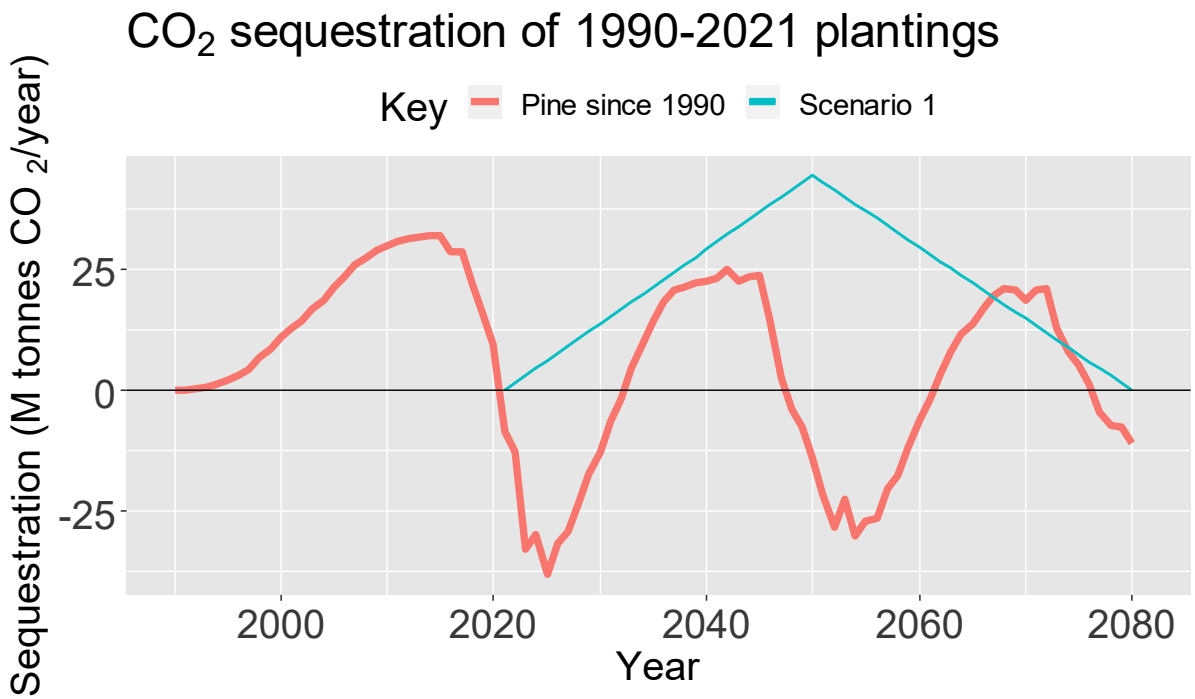

Figure 20 – The effect of new plantation forest establishment on annual emissions (negative) or sequestration (positive) are shown in red, while the triangle initially estimated as required annual sequestration is shown in blue. Scenario 1 is where we wish to get to GHG neutrality by 1990

The consequence of our planting during the 1990s are that the actual requirement on an annual basis is somewhat more complicated (Figure 21).

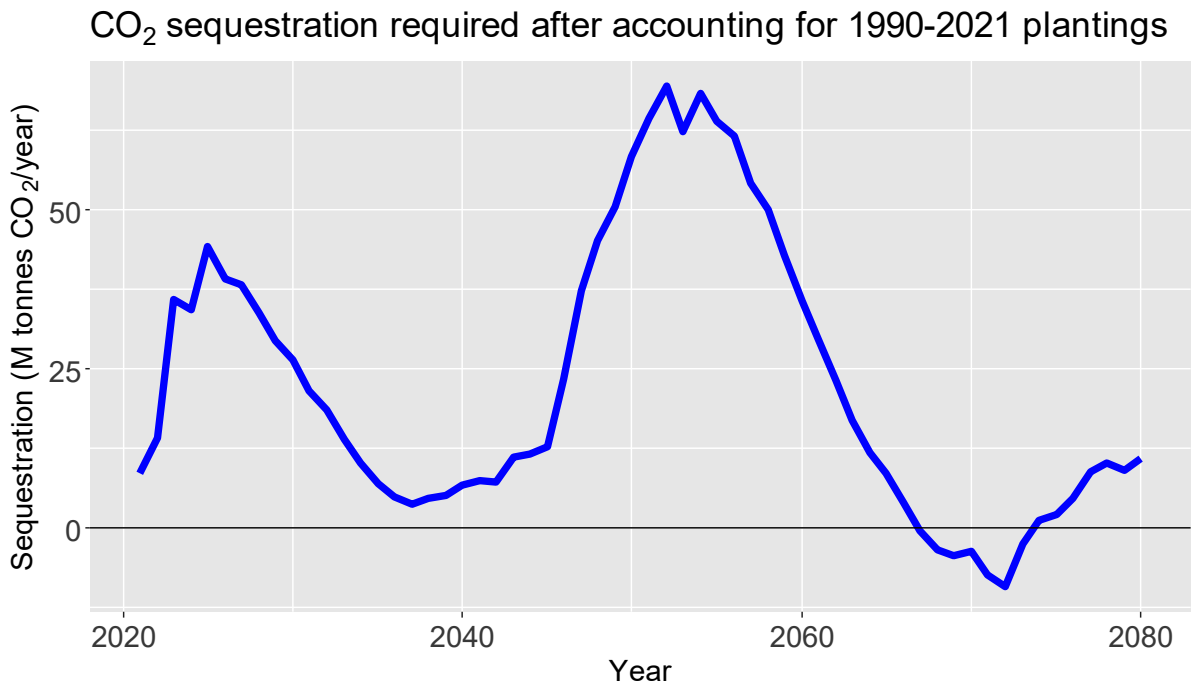

Figure 21 – The blue triangle (Figure 2) of required annual sequestration to reach GHG neutrality by 2050 is somewhat more complicated after taking into account impacts of new forest establishment between 1990 and 2021

As harvest ages of radiata pine plantations are often between 25 and 30 years after planting, a period of rapid afforestation during the 1990s followed by little new forest planting since creates a deep deficit in our accounts during the 2020s that is difficult to fill with new planting. Even radiata pine takes 4-5 years to appreciably begin to sequester CO_2, and so the best we can do is devise a planting programme that is reasonably realistic to sequester the amount required between 2022 and 2082, while allowing for some initial swapping of amounts between adjacent decades (Figure 22). The structural regime that fills the gap in our accounts would require about 2.16 million ha of new forest, with a planting programme is shown in Figure 23.

Tentative analyses suggest that as little as 1 million hectares of unharvested exotic forests might be required.

A similar analysis for unharvested native C forests is difficult to perform in detail until we get a clearer idea of impacts of species, site quality and stand management on sequestration rates, but tentative analyses using current data suggest that the area required would be at least double the area required for structural regimes of radiata pine to do the job, and possibly much more. Moreover, native species take much longer than rapidly-growing exotic species to begin to sequester large amounts of CO_2, and so we would need extremely large areas established during the next decade in order to make any worthwhile impact on our 2050 GHG neutrality target. This disadvantage is even more problematic for native species that are regenerated naturally. We shall do an analysis in detail once plot locations providing estimates of native forest C sequestration are publicly revealed.

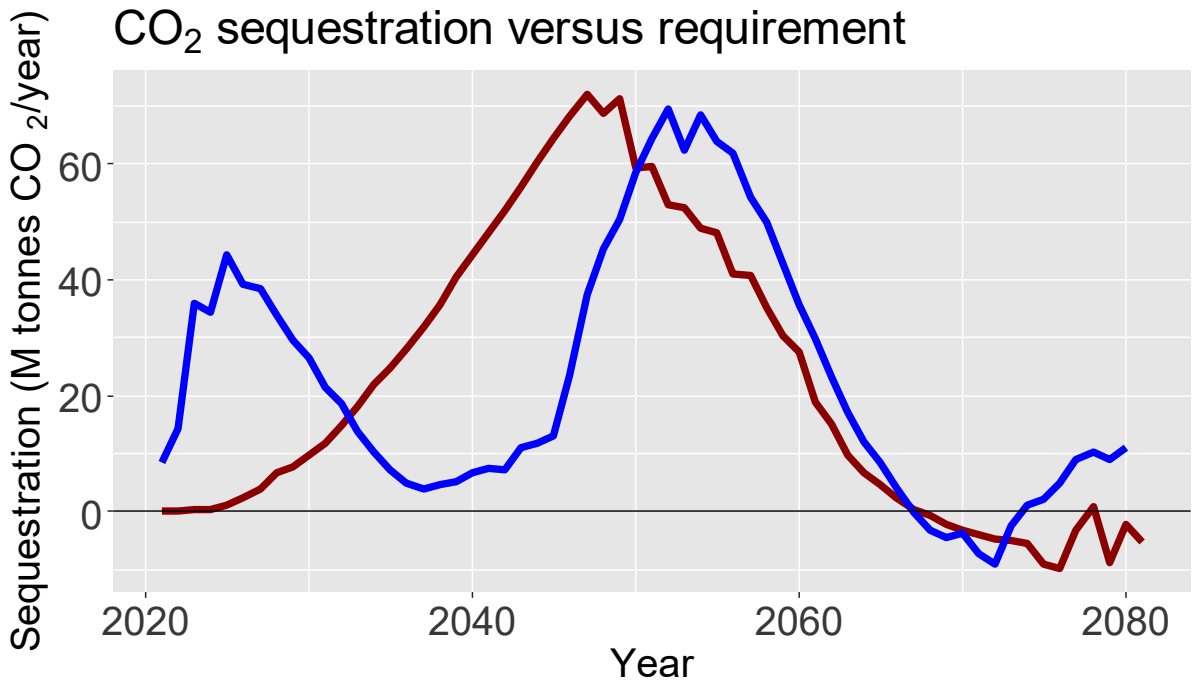

Figure 22 – Sequestration from a proposed planting programme on "Kyoto compliant" LUC classes 6 and 7 land of a structural regime for radiata pine (brown) versus the gap in our national carbon accounts after accounting for 1990-2021 plantings (blue)

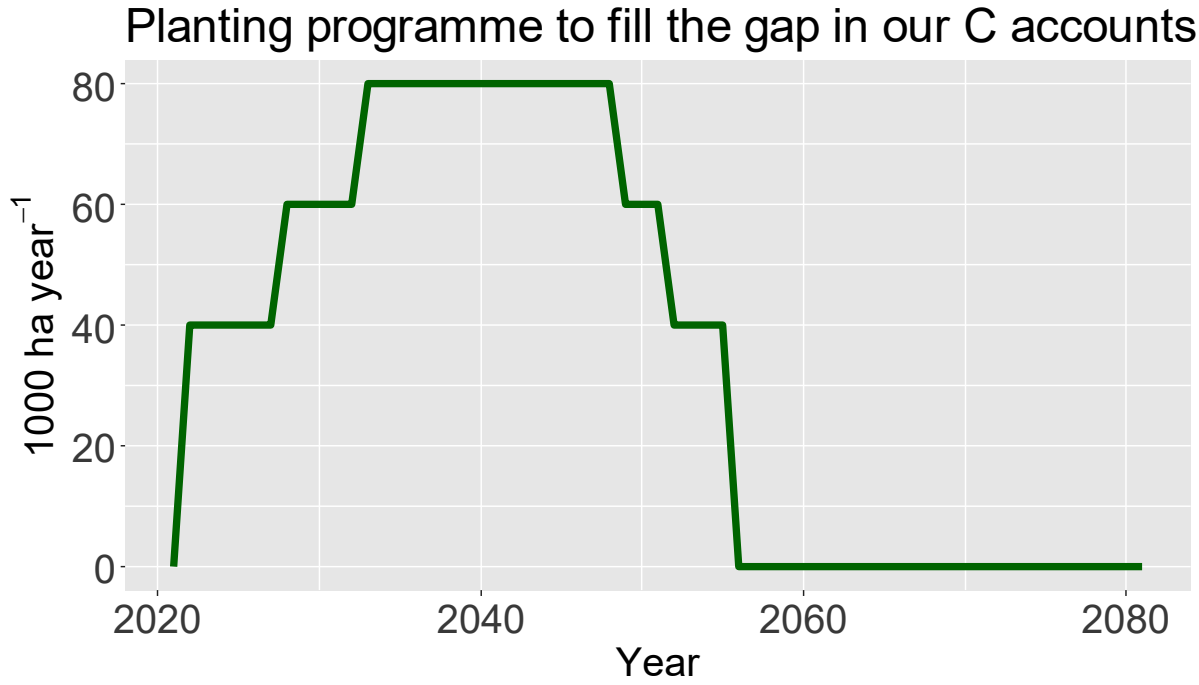

Figure 23 – New exotic forest planting programme for to fill the gap in our national C accounts

Such a programme is feasible, but not necessarily on all the land shown in Figure 4. Many areas are too remote, too erosion-prone, or too small to make harvesting environmentally safe and worthwhile. This is particularly true of Maori tribal lands and hill-country farmland whose profitability could be greatly enhanced by carbon forestry. Permanent carbon forests are a much better solution for those areas. Moreover, the area of unharvested carbon forest required to fill the

gap in our carbon accounts would be much smaller, because exotic species typically continue to sequester CO_2 at a rapid rate for many decades after typical rotation ages for wood harvests.

Costs of afforestation

Costs of new forest planting vary with species, seedling type, sites, site management activities, and stems/ha established.

The cheapest option is likely to be radiata pine, as seedling costs are usually 35 cents per tree, 800 to 1000 stems/ha is typical, planting stock is usually bare-rooted, and trees grow rapidly enough that management of weeds is not required for long. Eucalypts are a bit more expensive, because although bare-root seedling technology has been developed for eucalypts, they are most often delivered as containerised stock, at up to $1/plant in bulk. Planting into pasture is inexpensive, with often as little as a year of spot weed control often required for effective survival after planting and rapid initial growth. Under such circumstances plantation establishment can cost less than $1500/ha, but this can rise if control of high densities of woody weeds, soil cultivation, or fertilisation are required.

Adam Forbes (2022) conducted a survey of native forest restoration costs. Plants are generally delivered as containerised stock and costs ranged from $0.6-10 per plant. Overall costs per hectare varied widely, but averaged just over $7000/ha. Many forestry consultants regards this average as a low estimate. Bare-root seedling systems were developed for many native species by the Forest Service, but these technologies are rarely used today. Technology for seed collection and storage requires more development, and there appears to be scope to make establishment of native plants much more efficient.

The flawed ”emissions leakage” argument

The “emissions leakage” argument states that if we reduce GHG emissions in New Zealand by lowering production of GHG emitting industries then this will result in an increase in global emissions because production will increase in other, less GHG-efficient producers in other countries. Three critical assumptions of this argument are questionable.

a. The assumption that we are the most GHG-efficient producers is sometimes supported by New Zealand studies and widely trumpeted in New Zealand media, but studies elsewhere do not necessarily agree. For instance, Wirsinius et al. (2020) identify Denmark, France, Germany, Netherlands, Spain, and Sweden as countries that have lower CO_2-e emissions per kilogram of milk than New Zealand does.
b. The assumption that other countries will not seek to reduce emissions and simply allow expansions of their GHG emitting sectors if we reduce ours is also questionable. As the climate crisis deepens people will become increasingly reluctant to purchase products that have a high GHG emission footprints, and governments are likely to place restrictions on those products, such as border carbon adjustments (Branger & Quirion, 2014).
c. The assumption that international trading partners will ignore our GHG pollution is unlikely to be tenable as the climate crisis worsens.

Some analysts suggest that leakage may be absent or even negative with technology spillovers, and in a meta study of carbon leakage ratio (the increase in GHG emissions elsewhere divided by the

reductions in a country with stringent GHG reduction policies) rates of leakage were found to be relatively modest, from 5-25% (Branger & Quirion, 2014). This means that reductions in GHG emissions from New Zealand's agricultural sector would still be beneficial for the environment.

Response to questions in chapter 2 of the discussion document

I agree that we ultimately need to reduce gross GHG emissions to near zero. Forests can only be temporary carbon sinks, allowing us time to make other changes that will reduce gross emissions. However, as shown by the Globe study (Vivid_Economics, 2017), we cannot reduce our gross emissions rapidly enough to meet our 2050 net GHG zero target, and exotic carbon forests are vital tools for filling the gap in our accounts, as shown above. Native forests are too expensive, take too long to establish, and also sequester CO_2 much more slowly than exotic forests, hence greatly reducing their cost:effectiveness as a means to fill the gap in our national carbon accounts.

I do not agree with the assessment of the threat posed by exotic carbon forests to our gross emission reduction objective. *Writers of the discussion document assume that the supply of NZUs will increase while the demand for them remains small, while overlooking the requirement for us to greatly increase the demand for NZUs.*

Using the flawed "leakage argument" as an excuse, we exempt agriculture, which emits 49% of our national gross GHG emissions (MfE, 2023), as well as gifting 6.5 million NZUs (8.5% of our total gross emissions) to trade exposed industries. If these polluting sectors were required to purchase NZUs then the demand would greatly increase, and the impact of forest-based credits on the NZU price would be much less. Moreover, changes to the assessment of sequestration on small woodlots less than 100 ha would further reduce the impact.

As outlined above, small woodlots are required to use lookup tables for calculating C sequestration that in the case of exotic species often greatly underestimate C actually sequestered in woodlots. This motivates people to purchase whole farms in order to establish larger C forests, driving up land values in the hill country and threatening hill country communities based on pastoralism. Returns from pastoralism in our hill country are small, and so large-scale conversions to forest do not threaten our economy, but they do threaten hill-country culture. If farmers could earn more from small C woodlots then whole-farm conversions would be less frequent, farms with small woodlots would be more profitable, and the ETS would become more popular in these communities.

So, we need much more new forest than we currently have in order to get to our 2050 net zero target, and instead of regarding forests as a threat we should welcome their contribution, we can and should afforest differently, though, encouraging small woodlots on farms, with ultimate conversion to native forest as a long-term objective. More realistic estimates of sequestration rates in small woodlots and also entry into the ETS of agriculture and trade-exposed industries would get us there.

Response to questions in chapter 3 of the discussion document

The Globe study (Vivid_Economics, 2017) made it clear that we need removals of CO_2 with forest sinks in order to meet our 2050 target.

Response to questions in chapter 5 of the discussion document

Both gross emission reductions and GHG removals are important, because new forests are only temporary sinks, and ultimately reducing emissions is the only sustainable option. However, we can't immediately get to zero gross emissions and our 2050 target must be partly met by removals. Currently it is often cheaper to pay for removals than make reductions, but that is with 57.5% of emitters not participating in the ETS and small woodlots poorly rewarded for sequestration.

Response to chapter 6 of the discussion document

The status quo is not working well. Most of our emitters aren't even in the ETS, auctioned credits are essentially fraudulent, sector lobby groups have far too much political influence, and the price of credits fluctuates to the point where most money is made via speculation in the ETS rather than by actually helping to mitigate climate change.

Option 1 is partly sound. The government should not auction credits.

Option 2 is deeply flawed. The last time we allowed emitters to purchase international credits our NZU price dropped to $3, and people still hoarded them because international credits were available for as little at 10 cents each. This policy created the credit hoarding problem we now face. Moreover, in the unlikely event that purchased international credits were not fraudulent, we would be paying other people to make changes in emission behaviour that ultimately we will have to make ourselves.

Option 3 would distort an already deeply distorted ETS. We already pay polluters to pollute by giving them free allocations or auctioning credits at low prices, when really the only people awarded credits should be those sequestering C. Credits that do not represent anyone cleaning up GHG emissions are the largest threat to our ETS market and credit price (See appendix 2). Credits for reduction activities should not exist. The reward for reducing pollution should be that the former polluter no longer has to purchase credits.

Option 4 is fundamentally irrational. The government proposes to allow people who purchased fraudulent credits or who were simply gifted fraudulent credits due to an irrational fear of leakage to sell their right to pollute while those actually removing pollution from the atmosphere would face a hugely restricted market and lower credit price. This is fundamentally unfair.

The government's suggested changes to policy are potentially damaging over-reactions that are unsupported by what we currently know about sequestration rates of native & exotic forests and the potential to convert exotic C forests to native forests after they have served their purpose as rapid carbon sinks. They have already sent shivers through the forestry sector and undermined attempts to create forests to fill a well-known gap in our national C accounts, meaning that we may face billions of dollars in foreign credit purchases in future without changing our behaviour substantially.

Response to chapter 7 of the discussion document

7.1 Should co-benefits be recognised in the value or quantity of carbon credits awarded for afforestation?

Making a change such as this would further distort the ETS, and the idea of "greenhouse gas neutrality", so vital to the credit market, would become even less tenable. By all means put more money into increasing indigenous biodiversity, but don't pretend that it sequesters more C than it actually does.

7.3 Should a wider range of removals be recognised?

All verifiable C sinks should be included in the ETS.

Comments on C forestry

Whole-farm conversions

It has been suggested that whole-farm conversions to carbon forests are a threat to vital export industries, but this is not so. This would be true if conversions were of dairy farms, but almost all carbon forests are established on hill country farms, usually land use capability classes 5 or 6, and on such land farming makes very small returns on investments even in good years. We need to recognise that such conversions are not threatening our economy, but instead they are perceived as a threat to a way of life. They are a social problem, not an economic one.

We should therefore seek to enable farmers to establish carbon forests on small portions of their farms.

Under-estimates of sequestration rates in MPI's lookup tables provide an incentive for whole-farm conversions because areas of C forest greater than 100 ha allow land owners to avoid using low lookup table rates. It is therefore vital that lookup tables for all species be made more accurate across a range of species, sites, and stand management activities. An alternative would be to develop cheap assessment strategies, such as LiDAR, to rapidly assess biomass in small woodlots so that farmers might gain the full value of the carbon they sequester. This change would make small C forest woodlots on small portions of farms more financially viable.

Given weaknesses of the underlying assumptions and results from empirical studies, use of the leakage argument in New Zealand as a justification for doing nothing in some sectors cannot be justified.

Exotic versus native species

As outlined above, exotic species generally sequester at much more rapid rates than native forests on the same sites, given similar management, and exotics are currently far cheaper to plant than native forests. Natural regeneration of native forests is feasible but usually takes far too long to be of use during the critical stage when we require forests sinks to fill the gap in our carbon accounts.

If we proposed to fill the gap in our national C accounts with unharvested exotics we would probably need as little as 1 million ha of new forest. Instead of restricting species choice to slower, more expensive native carbon sinks, the government could reduce the likelihood of unwanted outcomes by requiring that all "permanent forest carbon sink" establishment proposals, for both native and exotic forests, be accompanied by a comprehensive plan, outlining:

1. The long-term future envisioned for the forest
2. A monitoring plan
3. An adaptive management plan
4. A plan for pest control
5. A plan for financial support of stand management and required research

The plan should be a binding agreement between land owners and the crown. The requirement for approved management plans for harvesting of native forests on private land is a precedent for this kind of policy.

If we filled the gap with periodically harvested exotics we would need about 1.75 million ha of new forest, and the future of that forest would be to provide extra value to our economy via increased exports of wood products. We should, however, be mindful that not all sites are suitable for production forestry with exotics, and these new forests should only be permitted in suitable land, where harvesting and re-establishment will not pose a risk of erosion and slash movement during cyclones.

Estimates of the area required to fill the gap with native species, allowing for the types of land available, are problematic because we cannot simply say native species might ultimately sequester at half the rate of our fastest growing exotics, therefore we need twice the area, because native trees take a long time to establish, and our target year for greenhouse gas neutrality is only 27 years away. A very conservative estimate suggests that we might need approximately 3 million ha of planted, unharvested native forest on hill country land to fill the gap. This option would be extremely expensive and the required area may be even greater than our optimistic projections.

Some alternative proposals

It is clear that with appropriate planning we can record our current trajectories and plan required pathways to get to our 2050 target and beyond (for instance see Figure 21 above). At present we are doing far too little to address climate change because:

1. we give away or auction too many fraudulent credits;
2. more than half of our GHG emitters do not have to pay for polluting;
3. our lookup tables of sequestration rates for species, sites and silvicultural management are extremely inaccurate for small woodlots. We therefore incentivise mainly large blocks of C forest and deny farmers the opportunity to profit fully from small blocks of trees while they continue to farm;
4. we use a highly questionable rationale to continue polluting that we call “leakage” despite the fact that it is based on faulty assumptions and that international evidence suggests it is not a serious problem even for leakage to third world countries that have few, if any, international climate change mitigation commitments;
5. we make knee-jerk changes to the ETS that further complicate it and often water down the effectiveness of the scheme, resulting in wild fluctuations in credit prices.

The most obvious improvements in the ETS, consistent with its original intent, would be to:

1. stop creating fraudulent credits and auctioning them;

2. stop giving credits away for allowed pollution under the highly questionable justification of “leakage”;
3. bring all greenhouse gas emitters into the scheme on an equal basis;
4. enable realistic rewards for sequestration with woodlots < 100 ha;
5. require C foresters to lodge a plan for the long-term future of their C forests, and if necessary, set aside funding to pay for future management.

Such measures would greatly restrict the supply of NZUs while increasing demand, providing an incentive for people to reduce emissions rather than purchase credits.

Appendix 1: Research required

Several avenues for research can improve our knowledge and allow us to make better policy decisions:

1. We need to be able to predict with more certainty where exotic species can act as effective nurse crops, and also to understand where this might happen naturally, and where more costly intervention is required to make it happen.
2. We need much better estimates of how rates of C sequestration are influenced by species choice, sites and silviculture for both exotic and native species, and lookup tables need to be more realistic.
3. We need to work to make growth of native seedlings in nurseries more efficient, and to improve survival and growth after planting them.
4. We need to more clearly delineate sites where debris flows after harvesting will be a problem, and implement technologies to ensure that they do not occur.

Appendix 2: Why auctioned and gifted credits are irrational

In a well-functioning emissions trading scheme, polluters would have to submit credits in order to be allowed to pollute, and they would purchase credits from those who cleaned up their pollution. So if the cost of cleaning was higher than the cost of reducing pollution in the first place then they'd choose to reduce emissions. Either way the atmosphere would not receive any more GHGs and purchasers of carbon credits could rightly call themselves "greenhouse gas neutral".

However, that's not what's happening. If a polluter reduces their pollution then they can sell credits gifted to them for their “allowed” pollution because of an irrational fear of “leakage”, or that they have purchased in an auction where fraudulent credits are simply made from thin air and don’t represent anyone cleaning up the atmosphere. They also assert that purchasers of their credits can claim to be "greenhouse gas neutral". They are *wrong*.

There are many ways to explain why they are wrong. You could use stories, mathematics, graphs or even children's blocks. Let's use the latter.

Blocks below represent levels of greenhouse gas in the atmosphere and levels planned to be emitted by two polluters.

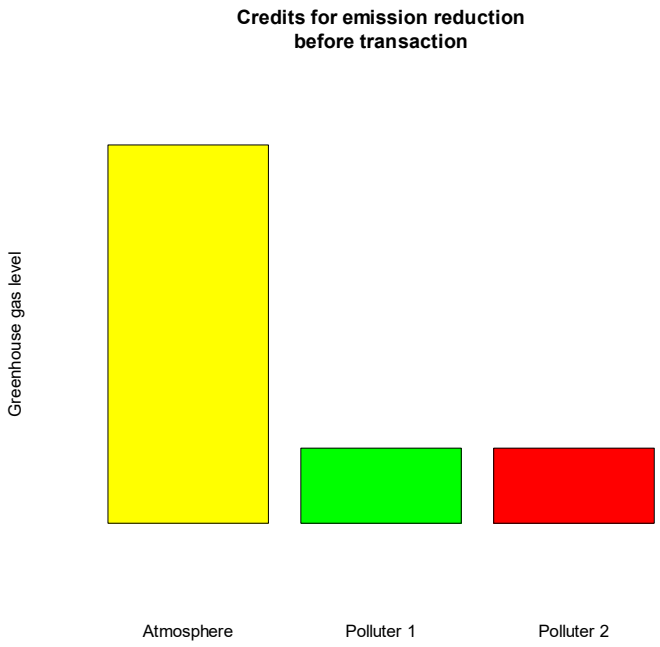

Figure 1

Then polluter 2 opts to no longer pollute and has grandfathered carbon credits for sale. Polluter 1 purchases those credits and is allowed to pollute. The result is more greenhouse gas in the atmosphere, as shown below. Polluter 1 clearly *cannot claim to be "greenhouse gas neutral"*.

Figure 2

So, what kinds of credits can confer greenhouse gas neutrality on a purchaser? Let's reach for the blocks again. In this case, we have the atmosphere, a potential polluter and someone who will take

greenhouse gas from the atmosphere (maybe using new trees, a scrubber, or perhaps by seeding the ocean with iron to promote plankton); a sequesterer.

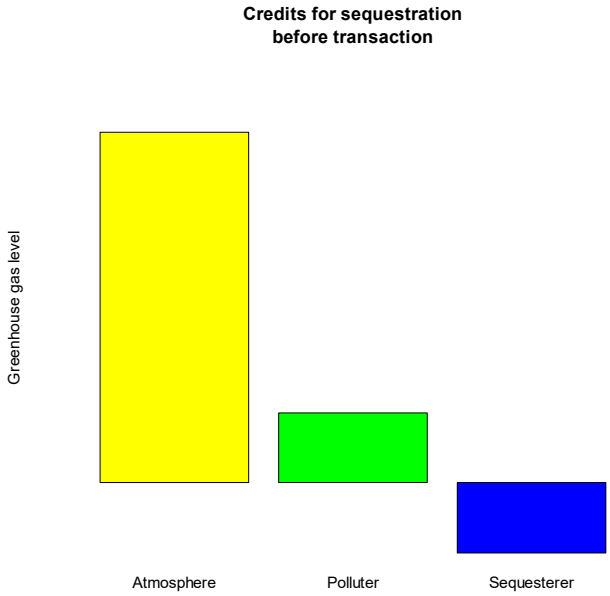

Figure 3

The sequesterer receives carbon credits for removing greenhouse gasses from the atmosphere. They are purchased by the polluter, who then goes ahead and pollutes, but the amount of pollution is exactly equal to the amount of sequestration and so the result is shown below:

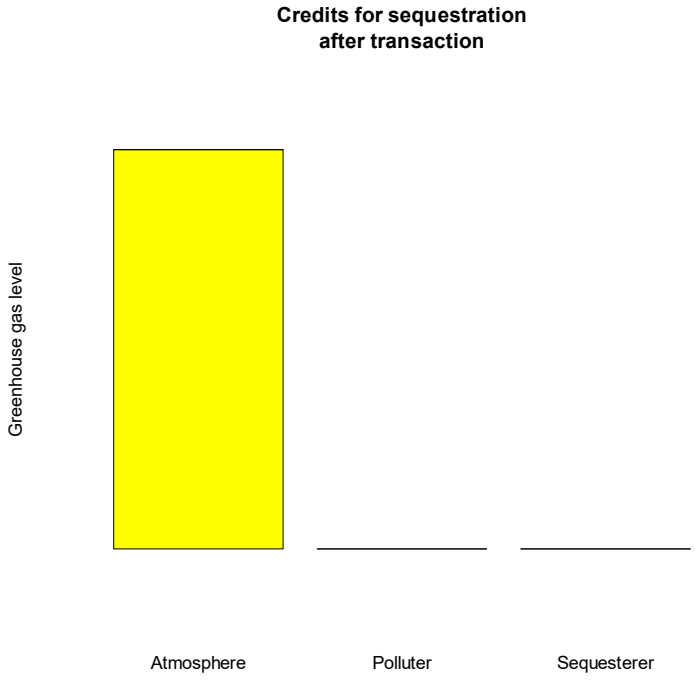

Figure 4

Clearly, the atmosphere gains no new greenhouse gas and the polluter can now claim to be greenhouse gas neutral.

It is generally much cheaper to do nothing than to extract greenhouse gasses from the atmosphere. If we allow people to sell carbon credits for simply reducing outputs of greenhouse gas, we effectively pay them for nothing because their reward for reducing emissions should be that they no longer have to purchase credits.

Our current scheme is essentially irrational with respect to gifted and auctioned credits.

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11 August 2023

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By email: etsconsultation@mfe.govt.nz

Dear Sir or Madam

Bank of New Zealand's submission on joint Ministry for the Environment, Ministry for Primary Industries and Ministry of Business, Innovation & Employment Review of the New Zealand Emissions Trading Scheme: Discussion document

Introduction

1. Bank of New Zealand (**BNZ**) welcomes the opportunity to provide a submission on the joint review of the New Zealand Emissions Trading Scheme (**NZ ETS**). BNZ's submission is based on our direct experience of the NZ ETS through the financing of carbon forestry and indirectly through our corporate relationships with companies operating in industries captured by the scheme. We acknowledge the benefits of transitioning to a low carbon economy in a fair and inclusive way, and the NZ ETS's role in delivering on that outcome.

2. BNZ welcomes the opportunity to meet with officials involved in the NZ ETS review to discuss any aspect of this submission or our related NZ ETS experience in the New Zealand financial sector.

BNZ's general comments on any proposed changes to the NZ ETS

3. BNZ acknowledges the important role the NZ ETS has in supporting the international commitments made by New Zealand, including those under the UN Framework Convention on Climate Change (UNFCCC) Paris Agreement.

4. BNZ notes the focus of the review includes an assessment of how the NZ ETS may be amended to provide more robust support for gross emissions reductions – we support this focus as part of an ongoing review and assessment to ensure that the NZ ETS delivers on its intended outcomes in an equitable way.

5. It is crucial for any market, including NZUs, that those participating have a level of certainty about the stable and enduring nature of that market in order to support investment in projects and assets with a long-term horizon. Given the timeframes associated with projects that deliver both emission reductions and removals, this long-term time horizon and consistency of approach is particularly important.

6. BNZ considers it imperative that the NZ ETS market design is effective in achieving gross emissions reductions. As a significant long-term lender to the New Zealand agricultural and forestry sectors BNZ also understands that stable market design will help to ensure that the NZUs generated and traded in that market are not subject to excessive price volatility. If price volatility was to be excessive, this could, in our view, limit the extent to which investment might flow into long-term projects where the predictability of returns is particularly important. BNZ agrees that a strong and stable price signal is essential to provide confidence in the market.

7. The timeframe for any changes to the NZ ETS should be clearly communicated as early as possible to provide greater certainty for market participants.

8. BNZ notes the potential for unintended consequences with the current NZ ETS, including changes in land use that may be accelerated or facilitated by the scheme settings. It is right in our view that the review considers these potential impacts on the environment, Māori, and rural communities. As noted earlier, if any changes are required to address those impacts, they should be implemented carefully and over a reasonable timeframe to avoid disruption and potential loss of confidence.

9. Finally, BNZ notes that while the NZ ETS has a role to play in supporting New Zealand's transition to a low carbon economy, it is important that a focus also remains on actual emissions reductions in order to achieve the successful economic transition.

BNZ is happy to meet with officials involved in the NZ ETS review. Please direct any enquiries to Paul Hay, GM Regulatory Affairs at [redacted]

Yours sincerely

Paul Hay
GM, Regulatory Affairs

NZ ETS Review

Submission | Aug 2023 | Kari Hunter

We must cut emissions rapidly and deeply - it's urgent!

I favour Option 4 over the other options, with Option 3 as second choice.

Globally, we are on course for climate change to cause serious danger of collapse of ecosystems, social systems, economy, human habitat.

Key points

Globally, we are on course for climate change to cause serious danger of collapse of ecosystems, social systems, economy, human habitat.

- We need the Government to take effective steps to get Aotearoa's emissions down rapidly and deeply starting now, and by more than 50% (better yet 80%) this decade.
- The current ETS system needs significant change if it is to provide serious support for getting emissions down fast enough and deep enough.
- ALL emissions should be addressed now with either market or non-market mechanisms.
- In some areas, we need more democratic involvement in allocations, so we can choose life-supporting winners over market driven waste and luxury.
- In some areas we need more regulation and more nuanced mechanisms to favour gross emission reduction and removal approaches that provide multiple benefits for human and ecosystem health.

The context

- While there is uncertainty about how fast the temperature will rise and when we will pass critical tipping points and domino effects, these pose existential threats to many species, to organised human civilisation, and to the life support systems - the habitat - of our human race.
- Scientists and citizens are becoming increasingly alarmed as industries and leaders have failed to take effective steps for our survival over the decades that this has been well known.

- Aotearoa has very high per capita emissions currently and historically, and so has both a high responsibility and high scope for reduction compared with most countries.
- As a Tiriti o Waitangi partner, the Crown has a responsibility to take action to protect all taonga protected under the Treaty from harm caused by our emissions, including whenua, awa, coastal ecosystems, whakapapa of mana whenua into the future, and so on. Failure to do so has the potential to contribute to a greater genocide than has ever happened before.
- The Crown needs to also ensure that changes to the ETS do not disproportionally disadvantage Māori. Engage in decision-making as Tiriti partners, and be prepared to find other measures outside the ETS if needed to ensure Māori are not economically disadvantaged by the changes. For instance, be prepared to contribute resources to support new or developing community enterprises that are developing low-emissions ways of living, or contribute funding for appropriate large scale public housing in areas where Māori are affected by housing poverty. (Healthy housing on land secure from flooding and 2-5 m sea level rise.)
- If we fail to meet the targets that we have committed to internationally, we will have obligations potentially in the 10s of billions. It would be inequitable to use public funds to subsidise high-emitting businesses, including agricultural ones, by funding any shortfall resulting in failure to meet NZ's international reduction targets. As well as the dollar cost, there are unlikely to be enough sound legitimate credits available internationally to meet the needs of all the wealthy countries that plan to buy them. We need to head for very close to zero gross emissions without using international emissions credits.
- We can reasonably require those who have contributed more to the harm and who have greater capacity to contribute to reductions and to the costs of adaptation to do so. Within Aotearoa, some industries and some (generally wealthier) individuals have contributed much more than other (generally lower wealth and income) sections of our society.
- With changes, the ETS can be a useful component of driving necessary emissions reductions.
- Other mechanisms are also needed to be effective at reducing emissions and to ensure that limited resources are well-used to support healthy people and healthy ecosystems as required for a Wellbeing Economy, to honour Te Tiriti, and to establish a more equitable society. Directly regulating some activities will be more consistent with healthy communities and healthy whenua.

Option 1

I do NOT favour this option.

I recommend both DECREASING the amount of emissions units available for GROSS emissions AND separating this from the removals mechanism.

- Set the amount of emissions NZUs available to help drive emissions down in line with a precautionary approach to the harm they cause. That is, consider the range of scientific predictions, not just optimistic ones.
- Stop allocating free emissions units to any private company.
- Create non-market allocation mechanisms to ensure that public entities and community organisations get some democratically allocated emissions for essential activities, including infrastructure for a low-emissions future.
- Include all significant emissions, including from fossil fuel, other combustion (eg so-called “bio-fuels”), and agricultural emissions. Existing ‘biofuel’ systems and supply chains in other countries have been shown to result in high emissions. Industrial agriculture is a major source of emissions. Requiring the agriculture sector to pay for emissions like other industries, the more quickly it can turn to methods that restore soils, protect fresh water, coastal ecosystems and human health, and the better chance of establishing low-emissions polyculture approaches for food security.
- Set a course of regularly decreasing the amount of emissions units each year starting in the next available release, that is consistent with reducing total emissions from combustion and agriculture by at least 10% per year (better yet 15%) from now.
- Include emissions from international freight and travel.
- Find a way to incorporate embodied emissions in imported goods. This will help protect local businesses from unfair competition from imported goods that would otherwise have no or lower input costs for these emissions.

Option 2

I do NOT favour this option.

- We and every other wealthy or highly industrialised country need to get our gross emissions down. We are aiming for (very nearly) zero gross emissions. There is no way to trade our way out of cutting our actual emissions that is consistent with securing our future habitat.
- Adding in international trading increases the risk of loopholes or unintended consequences that may undermine the effectiveness of the ETS mechanism.

Option 3

This is not my preferred option, but it is preferable to Options 1 and 2.

I support placing restrictions and conditions on removal activities. I suggest separating removal activities from the emissions market, favouring native polyculture forests over monocultures (especially pine and highly flammable natives like manuka and kanuka)..

- This can make the ETS mechanisms more effective in driving emissions reductions. Removals should not be used to enable ongoing emissions.
- It can also enable more nuanced management of removal activities, so that they are done in ways that support multiple benefits including healthy communities etc. In many places, trees can provide multiple benefits. For instance, they may be chosen and planted to hold soils against erosion, to provide shelter belts, to provide food, and to support polycultural and permacultural horticultural systems in addition to removing carbon from the atmosphere.

Option 4

This is my PREFERRED option.

I support separating incentives for gross emissions reductions and C02 removal. That is, NOT permitting gross emitters to purchase NZUs from foresters to pay for their greenhouse gas emissions.

- We need emitters to reduce emissions.
- No plantation forestry can be guaranteed to be permanent on the relevant timescale – the fossil fuels being burned are millions of years old; the forests will become increasingly vulnerable to fire and pests within decades.
- We need more trees. We also need forestry to be managed for purposes other than C02 removals, consistent with supporting communities and protecting food security. Many people will need to relocate as part of a managed retreat. Food security is likely to become increasingly challenging. Pure market mechanisms can not be expected to manage this well.
- In many situations, trees integrated into biodiverse

Improve incentives for native forests

I support improving incentives for locally appropriate biodiverse native forests.

Additional ways to protect and build carbon stores

I favour investigating ways to manage (protecting and restoring) all significant carbon stores. Include wetlands, agricultural soils, and sea bed.

Regulate to rapidly phase out artificial nitrate and imported phosphate fertilisers and consider measures to encourage reduced tillage, increased cover crops, etc, to help protect and restore soil microbiomes, safe drinking water, and healthy aquatic ecosystems. This is especially important in any area where fresh water and drinking water is already shown to have harmfully high nitrate levels. Excessive nitrates contribute to nutrient excesses in waterways that kill native biodiversity in freshwater bodies, that cause overgrowths in the ocean that have been creating ocean dead-zones (releasing emissions), and that make drinking water unsafe.

Ban imported PKE - it contributes to devastating off-shore deforestation, and supports too many high-emissions cattle.

Ban ocean bottom trawling, especially on all sea mounts. Recently, it was shown that bottom trawling on the sea bed disturbs larger amounts of carbon-rich sediment, releasing much higher emissions, than previously known. Where there are rich seafloor habitats, such as on sea mounts, trawling destroys these habitats and they may take hundreds of years to recover, if ever. When they are nurseries for marine species in the wider ocean, destroying them also means reducing fish numbers. Whether or not seabed destruction is already specified in our international agreements, it is vitally important that we stop these activities, for the sake of emissions, healthy ocean ecosystems, and future food security. It is the best way to ensure there are fish in the future.

Regulate to rapidly phase out artificial nitrate and imported phosphate fertilisers,

Complementary measures to reduce emissions

A carbon market can be a useful tool, but it is not well-suited for managing all the emissions reductions There are emissions cuts that can be made. The effects of reducing the number and increasing the price of NZUs will pose challenges on several fronts. I suggest addressing these with complementary measures.

Create a citizens' dividend. Use a portion (maybe ⅓ - ½) of the Government's revenue from selling NZUs to fund equal payments to all residents).

- This can help make the ETS and the consequent increases in prices more acceptable to everyone.
- For those people who have no immediate alternative to driving fossil-fueled vehicles, and who would otherwise be unfairly impacted by the emissions costs, this dividend can help provide some support during transition.

- Some of the revenue can be used to support transition and adaptation in other ways, so that all of us can transition to lower emissions lives.

Some wasteful and luxury emissions will need to be reduced. For instance, the aviation industry needs to be legally required to reduce the emissions they contribute to. There is no such thing as “sustainable aviation fuel.” (It’s variously used as a greenwash term for unsustainable fuel such as “biofuel” or as a reference to technology that is not currently available and may never be at scale. Many flights are for holidays and tourist trips. We don’t as a society have the luxury of being able to sustain this. Greater wealth does not morally entitle some people to burn the habitat of others who have not contributed to the harm.

I favour more input from well-informed democratic governance, involving central and local government, Hapu and Iwi, community organisations, and some form of Tiriti-based citizen’s assemblies, contributing significantly to decisions about how to manage managing the shrinking pool of available emissions to meet essential needs for healthy people and a healthy environment. Well-run Citizens Assemblies can help provide well-informed decisions making that can garner more trust and support.

Closing

Existential threats demand strong emergency measures.

I encourage you to revise the ETS and complimentary approaches to take a much more ambitious approach to emissions reductions, not just to meet formal international agreements, but more importantly to be part of protecting the only home we have.

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11 August 2023

Ministry for the Environment
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Attention: Submissions Analysis Team

Ministry for the Environment's Discussion Document on the New Zealand Emissions Trading Scheme (NZ ETS) Review. Te Arotake Mahere Hokohoko Tukunga

Introduction

1. Pāmu (brand name for Landcorp Farming Limited) welcomes the opportunity to provide feedback on the New Zealand Emissions Trading Scheme (NZ ETS) Review (Review).

2. Pāmu, a state-owned enterprise, has extensive involvement across the agricultural sector. Our portfolio includes farms that produce bovine and specialty milk, beef, lamb, venison, wool, velvet, avocados and timber, among other products. Pāmu's 110 farms cover 363,488 hectares and are dispersed nationally.

3. Pāmu is a member of Business NZ, Federated Farmers, DairyNZ, Beef + Lamb and the Sustainable Business Council. These organisations will submit on behalf of their suppliers and members.

4. Pāmu acknowledges that the Review outcomes could significantly impact forestry practices in New Zealand and affect some farmers more than others due to their land attributes and enterprise mix. This submission comments on aspects of the Review that directly impact Pāmu's farming business and where we believe unintended consequences might arise.

5. Pamu's forestry portfolio comprises ~16,000 hectares of plantation forestry, ~12,000 of native species including regenerating and QEII covenants. Plantation forestry is principally *Pinus Radiata*; other species include various Eucalyptus species, oak, and totara. Between 1000 and 2000 hectares of forestry are scheduled to established each year through to 2030. All ETS qualifying new plantings are registered.

6. Pāmu has an important role to play in evaluating technologies and demonstrating at a farm systems scale how these could reduce the environmental effects of farming and improve farming's social licence to operate. This includes an explicit role within the national Emissions Reduction Plan to find ways to accelerate emissions reduction on pastoral farms.

7. As such, Pāmu is committed to reducing its climate impact through emissions reduction and strengthening climate resilience through adaptation. Our work in climate response is evolving and

includes setting a Science Based Reduction Target, pursuing 'highest and best' land use' (including forestry complementing pastoral livestock), ensuring climate risk mitigation is embedded in the organisation, and responding to market and consumer requirements.

8. Our FY22 GHG footprint was 722,237 tCO_2e. We, like other farmers, face significant challenges in reducing our emissions; hence our strong focus on collaborating with others to identify technologies and practices that will enable this to be achieved cost effectively and efficiently.

9. Initiatives underway at Pāmu to reduce emissions include all 110 farms gaining Toitū 'carbon reduce farm certification', diversification of land use to lower emissions plant-based enterprises (such as forestry, horticulture and other plant crops), and partnership with Focus Genetics and AgResearch to breed low methane emission livestock. Further work, developed as part of the Pāmu response to Action 13.4.2[1] of the Government Emissions Reduction Plan, includes:

    - Understanding the GHG efficiencies gained through repurposing bobby calves into Dairy Beef;
    - Exploring the establishment of new methane measurement facilities for livestock in the North and South Islands;
    - Identifying and implementing low emission technologies for dairy farm effluent ponds;
    - Hosting field days to share learnings and gain farmer and expert input; and
    - Undertaking scenario modelling of low emissions practices on farms (i.e., a digital twin approach to identify the optimal transition pathway).

10. Pāmu has commissioned modelling research to identify localised climate change impacts across our farming portfolio through to 2050. This modelling includes forecasts of temperature change, rain and wind events and the impact on pasture production. This modelling will help determine land use change into areas such as horticulture. In addition, Pāmu is incorporating the biodiversity and water benefits with respect to our forestry and regeneration projects, and the protection of areas under QEII covenants.

11. Pāmu is continuing to work with research agencies and suppliers/customers to test and trial novel practices that could assist the agricultural sector to achieve emissions reduction targets.

Summary

- Pāmu agrees with key objectives of the Review, namely "maintaining the incentive for carbon removals like forestry" and achieving faster reductions in gross emissions. However, Pāmu does not assess any of the proposed options as being acceptable.
- Further, given the long-term nature of forestry investment, Pāmu believes certainty of ETS settings that incentivise and instil confidence to plant exotics species to meet both CCC budgets to 2035 and 2050+ fibre and timber demand requirements, must be complemented by measures outside of the ETS such as strengthened capacity for local councils to restrict where forestry can be planted such as by Land Use Classification (LUC) and improved firm-level reporting of emissions trajectories. Such measures are exemplified by the NPS for highly productive agricultural land[2] and recent Amendments to the National Environmental Standards

[1] Which requests Pāmu identify options to accelerate work in emissions reduction and demonstrate sector leadership

[2] See **https://environment.govt.nz/acts-and-regulations/national-policy-statements/national-policy-statement-highly-productive-land/**

for Plantation Forestry (NES-PF) to enable environmental effects of permanent pine forests to be managed the same way as plantation forests[3].

- Pāmu also believes complementary measures are necessary to address the CCC's concern about NZU over-supply[4] suppressing the ETS price for carbon, and that this oversupply should be viewed in the context of New Zealand's NDC and the potential for increased use of forestry carbon credits through the voluntary market.
- Pāmu supports parallel work on the redesign of the permanent forestry category including, and as part of this, consultation on establishing indigenous biodiversity credits.
- Pāmu is conscious of the role that it plays in ongoing Treaty Settlements. The Pamu portfolio of farms will continue to provide land assets for Treaty Settlements and therefore encourage the acknowledgement of concerns raised by Māori representative groups with respect to this Review.
- Pāmu believes the Review outcome should not be applied retrospectively to existing forests.
- Pāmu believes increased and ongoing education is required for firms and other entity governors and leaders regarding emission reduction pathways, abatement options, where offsetting is an acceptable interim option (such as hard to abate emissions from livestock on hill country), and more broadly the many ways forests contribute to emissions reduction, economic adaptation, and the protection and restoration of natural capital.

Responses to the Review

1. Pāmu has interpreted the issues raised by the Climate Change Commission ("CCC") that led to the Review as follows:
   1.1 Firms need to reduce their gross emissions and this would occur faster if ETS settings are changed to make offsetting with NZUs sourced from forestry less attractive than at present;
   1.2 Excessive tree planting rates will generate an oversupply of NZUs which will depress the Carbon price (and a high C price is required to change investment behaviour toward emission reducing technologies and practices). A related issue is the economic consequence of trees on land well suited to food production and thus global food security.
2. Pāmu's feedback to the Review recognises the importance of balancing the incentives for gross emissions reductions and emissions removals to achieve the 2050 net zero target and the critical role that the NZ ETS must play in achieving this balance.
3. The Review offers a high-level evaluation of the expected impacts from the proposed options. However, Pāmu is pleased that further analysis will be conducted before the government reaches a final decision on the NZ ETS review because some of the modelling assumptions used to inform the Review should be reassessed. As well the value of carbon sequestration by forests provides a verifiable transition option where abatement technology is not yet available or cost effective (such as hill country livestock farming) to lower the cost to firms, society and the environment of delaying emissions reductions. The absence of implementation details and quantification of impacts makes the provision of specific feedback challenging.

[3] As described at **https://www.mpi.govt.nz/forestry/national-environmental-standards-plantation-forestry/**

[4] Based on model outputs for particular set of assumptions that can be challenged for their veracity and robustness.

4. Pāmu has therefore focussed on specific recommendations that align with the objectives of the Review. With respect to the specific options, Pāmu is concerned that the Review could lead to policy decisions that would apply retrospectively to existing forests. Pāmu is supportive of a system that provides clear and consistent policy settings in advance so that decisions can be made with a full suite of information.

5. Pāmu agrees with the Review that to meet NZ's climate change goals, the Government needs to continue supporting removals to contribute to net emissions targets. Appropriately, the Review recognises that forestry is needed to contribute to global efforts to address climate change and emissions reductions to 2050 and beyond; and, acknowledges that forestry remains one of the most effective tools for removing carbon dioxide from the atmosphere and has a range of co-benefits (including providing biomaterials and products for a future low emissions, circular economy and protection of soils, water and biodiversity).

6. To highlight the significance of further land use change to forestry – and related confidence to invest in forestry - the CCC 5 yearly budgets to 2035 anticipate circa 35,000 hectares per annum to achieve 380,000 hectares of new exotic timber plantations and 25,000 hectares per year from 2025 for native species (300,000 hectares of new and regenerating forest by 2035). According to the National Exotic Forests Description (NEFD) statistics[5], these planting rates were only recently achieved (2021 and 2022). Indeed plantation forest plantings had only increased by circa 40,000 hectares by December 2021 compared to 2008 according to the April 2022 NEFD. Historical evidence amply shows the high sensitivity of afforestation rates to policy settings. Pāmu therefore acknowledges and supports the fact that none of the options include removing forestry from the NZ ETS without an alternative mechanism to incentivise forestry carbon removals.

7. While Pāmu agrees with one of the objectives of the Review, namely "maintaining the incentive for carbon removals like forestry", we are concerned by the CCC statement that the current settings risk a 'boom-and-bust' cycle for forestry (indeed the converse has been demonstrated over the past 9 months). Striking the balance between the incentives to reduce gross emissions and carbon removals will therefore be an important outcome of the Review. The CCC advice for the second Emissions Reduction Plan suggests the government should offer clarity on its planned contribution concerning gross emissions. This includes committing to specific levels of gross emissions in the second and third emissions budgets. This clarity becomes crucial for the Review as it would bring greater certainty to the volumes of NZUs involved, particularly in relation to the expected maximum gross cap and forestry removals. By providing this clarity, the government can better inform critical decisions on implementation, including NZ ETS reform.

8. Pāmu supports parallel work on the redesign of the permanent forestry category. Pāmu recommends that ETS settings that may lead to increased exotic planting (i.e. NZU price increases) be made in conjunction with complementary policy measures. These include:

    8.1 **Land use policy** – to enable right tree in right place and 'best' land use. The NPS for highly productive soils provides a precedent and is illustrative of why particular land classes (notably 3-5) should require a consent for the establishment of trees above a minimum threshold area (say x% of the farm area or yy hectares of the farm, which ever is greater). Second, even on class 6 & 7 land, Cyclone Gabrielle impacts revealed the NES-PF needs appropriate local site controls, implementation and monitoring.

[5] Accessed at **https://www.mpi.govt.nz/dmsdocument/55996-2022-NEFD-Report**

8.2 **Business level reporting** allows delineation of the types of GHG reductions and to focus on the reasons why and solutions for firms that are not reducing emissions. Business level emissions reporting allows the various types of GHG to be distinguished (such as farm-level will enable for methane (CH_4), nitrous oxide (NOX) and CO_2 sequestered for a farm business). Transparency at the firm level encourages businesses to "do the right thing" (i.e. reducing) whilst allowing a compliance focus on those who are not. It is important to appreciate, those who are not reducing their GHGs may have sound economic reasons i.e. they don't have access to effective commercially ready abatement technologies, as is the present case for most pastoral high country farmers. Here the solution is to allow offsetting but for farms is farm-level reporting (as proposed by HWEN) to show how net reductions in CH_4 and NOX are occurring (such as by practice and system change). Business reporting can be achieved by, for example, assessing the materiality of emissions and progressively extending the scope under the TCFD for firms that need to mandatorily report.

8.3 **Predator and wild browsing animal control**: Native species are not the panacea painted by some advocates – establishment costs can be five-fold and more compared to *Pinus Radiata* and, as the CCC has previously identified[6], in the absence of pest (notably deer, goats and possums) and weed control establishment is patchy and financially risky for landowners. While regeneration provides the best pathway for land-use change in some catchments (or parts thereof), landowner experience (Central Hawkes Bay, East Coast etc) indicates there must be a large-scale parallel and complementary control programme for browsing wildlife implemented as part of the transition pathway. Extending and strengthening Predator Free 2050's mandate could support this requirement.

8.4 **Use the ETS to reward** exotic to native species transition forests and other nature-based solutions (NBS) as currently being consulted on. The addition of a new category for transition forests to clearly distinguish them from Permanent native forests (as previously able to confidently tagged as Permanent Forests Sinks) and exotic species grown in plantations for timber and fibre production. This segmentation of NZU type would facilitate biodiversity premiums within the ETS rather than setting up a separate scheme (acknowledging the voluntary market is also legitimate source of investment to support biodiversity gains). Nature-based solutions are often cheaper and more effective over the long-term than hard infrastructure, like seawalls. Nature-based solutions include large-scale coastal and freshwater wetland restoration, riparian planting, the re-wetting of peatlands, and the establishment of permanent indigenous forests in erosion-prone areas. NBS also deliver significant co-benefits by removing more carbon from the atmosphere, providing habitat for native species, improving water quality, and creating employment and recreational opportunities. More of the market are using product foot printing using Science Based Targets (SBTi) methodology which means any land use change needs to be factored into calculations – and the ability to bring down net emissions using removals (forestry and native sequestration) will be a decision making factor going forward.

[6] Recommendation 25(3), p. 323 **https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/inaia-tonu-nei-a-low-emissions-future-for-aotearoa/**

8.5 **Consider incentives** such as accelerated depreciation on GHG reduction technologies like methane capture from effluent ponds.

9. Pāmu believes that more work needs to be done to align the other risks and benefits of forestry alongside ETS settings e.g. environmental, climate, social and economic risks. As an example, the impact on rural communities needing to make necessary land use change from pasture to trees (e.g. Managed retreat of some East Coast/other region farms, the need to control erosion) may have a larger adverse impact on the lowest return land for red meat (and wool) than allowing higher Carbon prices. Improved Land policy (6.1 above) will help ensure community resilience; in contrast removal of Carbon returns from classes 6, 7 & 8 will likely accelerate the decline of farm inputs and rural communities. More work needs to be done to see how the ETS settings incentivise (or not) within farm diversification? i.e. assist farmers retire less productive land, but not the whole farm. Pāmu's experience is diversification of farming enterprises is necessary to help with the sector respond to emissions reduction, climate adaption and market pressures.

10. One of the key outcomes of the Review is the management of NZU supply and the price effects. At first glance it seems intuitive supply exceeding demand will depress price. Others, such as the NZ Initiative in reference to "Hotelling's Rule" believe this view is simplistic[7]. The question is what is the best way to solve this?

    10.1 It is hard to differentiate between the price elasticity compared to price driven by policy uncertainty.

    10.2 Second, if complementary measures are applied – notably for land use (6.1 above) to restrain total supply, reporting (6.2 above) to provide transparency, and improved options to participate in the voluntary market – the over-supply challenge can be managed without deterring land-owner and investor confidence in forestry.

    10.3 Third, be sure future tree-derived product demand is adequately estimated (and, in this respect, if the source of material is to be from a *Pinus Radiata* forest this needs to be planted in the next 3-5 years, to provide supply in 2050 given 25 + year rotation). Te Uru Rakau's forecasts to 2050 show a supply shortfall in the 2030's and the forecasts do not account for substitution of products derived from oil & gas such as road surface bitumen (New Zealand uses circa 300,000 t/yr[8]). Further detail on this would be useful in the final consultation.

Pāmu would be happy to discuss any aspect of this submission with the Ministry for the Environment and welcome the opportunity to present the Select Committee.

Yours sincerely,

Dr Warren Parker
Chair

Mark Leslie
Chief Executive

[7] See Opinion piece: Dr Eric Crampton, Chief Economist at The New Zealand Initiative.

[8] Dr Florian Graichen, Scion. personal communication.

Submission to: Review of the emissions trading scheme and forestry settings

Ministry for the Environment,
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From Greenpeace Aotearoa
C/- Christine Rose
[redacted]

Greenpeace is a global, independent campaigning organisation that acts to protect and conserve the environment and to promote peace. Greenpeace is one of the world's largest and oldest environmental organisations, operating for half a century, since 1971, and now works in more than 55 countries. The New Zealand branch of Greenpeace (Greenpeace Aotearoa) was founded in 1974 and has grown to represent 35,000 financial donors and many tens of thousands of supporters.

Apologies for this slightly late submission due to illness.

Greenpeace submits that direct emissions reductions are needed and that relying on a flawed model which allows forestry offsets as an alternative to real emissions reductions is an inadequate response to the climate crisis which is clearly happening with devastating consequences here and around the world, right now.

Greenpeace Aotearoa supports the submission of the New Zealand Climate Action Network. New Zealand's response to emissions reductions is inadequate. We must do more - especially on the country's biggest emitter - industrial dairy. Given that agriculture is around a half of this country's emissions, and big dairy emissions are the bulk of these, and generate most of the superheating methane and nitrous oxide emissions, the best way to address climate change devastation is to reduce emissions by phasing out synthetic nitrogen fertiliser and lowering the dairy herd. To be effective at addressing climate change, agriculture should also be brought fully into the ETS.

It's clear from the recent acceleration of exotic pine planting that the settings in New Zealand's ETS are wrong. They are failing to prevent climate pollution and are encouraging more tree planting in areas which cause their own environmental problems - such as Tairāwhiti. Forestry offsets are a false economy - they are not a high integrity method of reducing climate change or stopping the climate crisis, they are just greenwash. Forests are not permanent, and themselves are at risk from climate change, and risk locking up land which is better suited to other purposes such as indigenous forest or food production. NZ's current and future targets and budgets must be met primarily through much greater reductions in gross domestic emissions and that requires direct regulation.
Postponing gross domestic emissions cuts by trading forest plantings is not scientifically defensible. Forestry varies in carbon absorption rates and is extremely impermanent (especially in the face of increasing climate-related

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wildfires, slips and infestations) compared to carbon slowly leaving the atmosphere over more than 10,000 years.

Māori have a profound interest in New Zealand's climate response - as Chapter 4 lists: the Crown's Tiriti obligation to respond fully to our global climate pollution crisis; growing the value of Tiriti settlement land as potentially 40% of forestry land; 40% of forestry workers are Māori, whānau Māori have disproportionately less financial capacity to transition to low/no emissions alternatives in response to cost increases; and half of Māori are under 25 years. But this description is incomplete and should also include the profound wairua/spiritual and whānaungtanga/kin relationship with Papatūānuku and Ranginui, stronger valuing of intergenerational equity, and the disproportionate harm from climate pollution - as demonstrated this year with eg. Cyclone Gabrielle particularly affecting Māori communities.

This ETS consultation must acknowledge that the enormous deforestation of Aotearoa after European colonisation is the main reason that New Zealand has had the highest cumulative per capita emissions since 1850 globally. If tikanga of the tangata whenua of Aotearoa had been the dominant value and way of life across the country after the arrival of European and other settlers, New Zealand would be in a much better situation right now.

Two centuries of colonisation and ongoing failure to honour te Tiriti o Waitangi has a very high cost (Jones 2015; Reid 2022).

To honour te Tiriti o Waitangi, and enable an equitable transition for Māori, the Government needs, at a minimum, to put Māori interests first, ahead of other ETS participants, eliminate all barriers for Māori participation and create equity for Māori in NZ's climate response.

Prioritising gross domestic carbon dioxide emissions reductions in the NZ ETS should be not just 'considered', but adopted, while protecting and advancing Māori interests, and we recommend the deletion of support for pollution removals out of the NZ ETS.

Early climate pollution cuts protect our climate the best - as emissions accumulate and remain active for millenia.

A new tightly capped biogenic methane limit must also be quickly established (in partnership with Māori) to cut agricultural methane. This will enable NZ to meet (and preferably exceed) our Global Methane Pledge of 30% cuts by 2030. The 30% pledge is the average global ambition - and there is a strong argument that faster methane cuts beyond 30% by NZ are fairer, so that nations who rely on subsistence cattle and rice paddies for basic food survival, can move slower than the Global Pledge 30% average. Although methane stays as a blanket for just 12 years, methane warms and expands oceans for much longer, and methane is 25 times more potent than carbon dioxide. Quick methane cuts are increasingly seen as a valuable tool as the world gets close to 1.5 degrees of global heating. We need direct regulation of synthetic nitrogen fertiliser supplied by just two main companies to achieve critical emissions reductions goals. Here in NZ, nitrous oxide (N2O) from farm fertiliser for a few decades is now 10.7% of our climate pollution problem, and 265 times more potent than carbon dioxide. Synthetic nitrogen fertiliser must be phased out by law, so this potent source of climate pollution is eliminated by 2030.

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We can't plant our way out of climate change. NZ simply cannot afford an ETS that tweaks our pollution profile - our society and environment need transformation in order to thrive over the years and decades to come. NZ's big climate polluters must pay the full price of their pollution before 2030, in order to safeguard our economy from greater climate chaos and instability.

Of the four consultation options, Option 4 is the least worst option, but we strongly urge the adoption of Option 4+ as outlined in the NZ CAN submission:

- **Option 4+ consists of two tightly-capped separate trading schemes for carbon dioxide cuts and methane cuts at the speed and scale NZ now needs.**
- **International traders are permanently excluded.**
- **The co-governed Carbon Removals Strategy and related Carbon Removals programmes mean New Zealanders all get a say in what gets planted where, for how long, and why.**
- **Laws phase out both synthetic nitrogen fertilisers and fossil-fuelled methane leaks by 2030.**
- **Direct investment and co-governance structures ensure that the interests of iwi,**
- **Māori and low-income households are safeguarded, as ETS changes drive rapid deep cuts and stop pollution decisions by all NZ's big climate polluters.**

More ambitious domestic emissions reductions are needed so that our government doesn't face a bill of billions of dollars for offshore credits in 2030 to cover the big polluters' failure to clean up.

Thank you for the opportunity to submit,

Regards

Christine Rose
Senior Climate Campaigner
Greenpeace Aotearoa

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August 2023

Ministry for the Environment

By email etsconsultation@mfe.govt.nz

DairyNZ Submission on the Review of the New Zealand Emissions Trading Scheme

Introduction

1. DairyNZ submits on the Ministry for the Environment's review of the New Zealand Emissions Trading Scheme (ETS).

2. DairyNZ is the industry-good organisation representing all 11,000 of New Zealand's dairy farmers. We seek to progress a positive future for New Zealand dairy farming through enhanced sustainability, profitability, and competitiveness. The dairy sector employs 55,000 people and generates $25.7bn in export earnings: 1 in 4 of every export dollar New Zealand earns.

3. DairyNZ is committed to dairy farming playing its part in transitioning to a low emissions economy alongside the rest of New Zealand. We have active programmes to support farmers as they transition to lower greenhouse gas emissions and build their resilience to a changing climate.

4. The rationale for the review of the ETS appears to be that New Zealand will over rely on forestry removals, with a correspondingly insufficient reduction in its gross emissions.

5. Agricultural biological greenhouse gas emissions are not a part of the ETS, but the ETS does capture farmers' energy and transport greenhouse gas emissions and costs. The Government is yet to announce details of an alternative pricing scheme for biological methane and nitrous oxide. The default legislative 'backstop' currently sees these emissions priced within the ETS at a processor level from 2025.

6. This submission provides DairyNZ's perspective on the necessity and operation of the ETS and how agricultural greenhouse gas emissions should be treated.

7. We believe that the ETS Review is premature without further consideration and modelling of New Zealand's long-term pathway to net zero and its implications. It is also difficult at this stage, and without further quantitative information, to recommend a preferred policy option.

It's important to have a stable and durable Emissions Trading Scheme

8. The Climate Change Response Act has had six major amendments since the ETS was included in the Act in 2008. The review's new focus on gross emissions reductions, positing changing property rights and re-valuing forestry removals has seen uncertainty grow and confidence fall. Recently, the NZETS secondary NZU market price has bounced around depending on Government announcements and

speculation – contrary to what is expected of a stable, durable, long-term, and singularly focussed mechanism.

9. New Zealand's ETS is a useful and necessary tool that helps New Zealand make choices to reduce greenhouse gases. For the ETS to work well, it needs to be effective, and other rules should work together with it to help it do its job.

10. Having a stable and durable ETS mechanism provides the following benefits to ETS market participants:

    - **Predictable Costs**: A stable ETS provides participants with predictability in terms of the cost of emitting carbon. When the rules remain consistent, businesses can better estimate their future emissions-related expenses, facilitating financial planning and supporting investment in emissions reductions.
    - **Long-Term Planning**: Companies often require significant lead time to implement emission reduction strategies. A stable ETS enables participants to develop and execute long-term plans to gradually reduce emissions, avoiding rushed and costly adjustments due to sudden changes in regulations.
    - **Efficient Resource Allocation**: With a stable scheme, participants can allocate resources more efficiently towards emission reduction technologies and strategies. They can confidently invest in projects that will yield long-term benefits without the fear of regulatory upheaval.
    - **Technology Innovation**: Stable policies encourage research and development of innovative emission reduction technologies. When participants know the regulatory landscape won't shift abruptly, they are more likely to invest in and adopt cutting-edge solutions.
    - **Stakeholder Confidence**: A durable scheme signals a commitment to emission reduction goals, instilling confidence in stakeholders, including investors, customers, and the general public. This can contribute to a positive reputation and improved relationships.
    - **Economic Stability**: A consistent ETS helps stabilize the market for emissions allowances, preventing sudden fluctuations in prices that can affect participants' budgets and strategies.

11. The ETS creates a market for emissions allowances, allowing the forces of supply and demand to determine the price of emissions. This encourages cost-effective emission reductions as participants strive to reduce emissions at the lowest possible cost.

12. The ETS can and should send an appropriate long-term signal to participants. While we note that a volatile price can have moderate impacts for petrol or electricity prices, the same cannot be said for land managers. In that instance, any volatility can have damaging effects, and some cases may prove irreversible e.g., wholesale conversion of farmland to forestry.

Set the direction first, understand the implications and then discuss ETS reform options.

13. New Zealand's approach to transitioning towards low emissions should begin by establishing a clear strategic path. Additionally, it is critical to have consistent support from political parties across the spectrum, to create a durable and stable framework for the transition.

14. If the Government agrees with the Climate Change Commission that the focus should now be on gross greenhouse gas emission reductions, while continuing to incentivise forestry removals, we need to know what that balance looks like over time, and how this will affect existing and future investments.

15. We agree with others, like Business NZ and Energy Resources Aotearoa that conducting a comprehensive quantitative analysis to determine the level of gross emission reductions intended up to 2050 is required before any options are decided. This analysis should guide policy development by providing clarity on the required gross reductions, which is essential for achieving a balanced approach in the ETS.

16. The options, as presented, remain too broad and non-specific. We expect further assessment of a gross emissions reduction pathway (and the implications for each option) as these fundamental changes need to be well understood before the Government commits to a way forward.

The Government buying NZU's adds to the expense of meeting New Zealand's already ambitious Nationally Determined Contribution

17. Option 2 in the consultation document would see the Government purchase NZUs to influence demand in the market. This creates an opportunity cost for the Government in that specific budget provision would be needed, presumably foregoing other non-climate related priorities.

18. We note that in 2022, the Commission estimated that if the Government achieves its first and second domestic emissions budgets, 99 Mt CO2e of offshore mitigation would still be needed to meet the NDC[1]. Treasury has estimated this as costing anywhere between $3,300,000,000 to $23,700,000,000[2], describing this as "a significant fiscal risk" (this works out to be roughly $4,700 per person in New Zealand). These costs to taxpayers and businesses should be quantified to better understand the choices and trade-offs associated with targets, carbon budgets, ETS unit supply settings and the options in this consultation document.

Multiple problems require multiple tools, not a "one-stop shop" Emissions Trading Scheme

19. The consultation document presents a variety of challenges with the current policy settings. These include:

    - A gap between emissions and New Zealand's 2030 target (page 17)
    - Excess offsetting and not enough gross emissions reductions (page 19)
    - The negative social and economic impacts of inappropriate afforestation (page 19, page 69)
    - The negative environmental impacts of inappropriate afforestation (page 19)
    - Current prices potentially not being sufficient to reduce gross emissions from energy, transport and industry (page 20)
    - Levels of indigenous afforestation lower than Climate Change Commission recommendations (page 20)
    - Limited removal alternatives (page 20)
    - Projected falls in New Zealand emissions prices (page 26)
    - Reduced export revenue due to large land-use change to permanent forestry (page 29)

20. It is difficult, and perhaps heroic, to see how reform of the ETS alone would be able to 'fix' all these issues – the ETS may instead become misguided and bogged down in trying to achieve multiple objectives. We believe that solving for externalities (be they positive or negative), that don't relate to

[1] NZ ETS settings for 2023-2027 (climatecommission.govt.nz)
[2] Ngā Kōrero Āhuarangi Me Te Ōhanga: Climate Economic and Fiscal Assessment 2023 (treasury.govt.nz)

the core function of the ETS (to reduce emissions) should be addressed through other mechanisms e.g. other regulation and/or schemes.

Remove the ETS Backstop for Agriculture – It won't work in New Zealand's best interests.

21. The NZ ETS remains the legislated 'backstop' for pricing agricultural emissions if an effective and workable alternative is not delivered. This provision can be 'turned on' at any time.

22. DairyNZ does not support agriculture going into the ETS. The ETS is neither appropriate nor sensible for farmers, rural economies, or the New Zealand economy. Significant modelling undertaken through the He Waka Eke Noa (HWEN) Partnership and the government's own work programmes have shown the detrimental impact of pricing agricultural emissions through the ETS. Ministers have also spoken in recent months about the inappropriateness of the ETS for agricultural greenhouse gas emissions - but the ETS backstop option remains.

23. Through the 'backstop' option:

    - Processors (dairy and meat) and synthetic fertiliser manufacturers and importers would be responsible for reporting and paying for methane and nitrous oxide emissions.
    - Emissions would be calculated using national average emissions factors for relevant products, e.g. milk, meat, and synthetic fertiliser.
    - The way emissions are calculated for a processor-level price would not reflect any differences in on-farm practices that change an individual farm's emissions. This would fail to incentivise behaviour change on farm to drive emissions reductions.
    - Short and long-lived gases would be treated the same with a carbon equivalence metric (GWP100) – contrary to split gas domestic targets and our latest science understanding.
    - Methane does not need to get to net zero like the other bundled gases in the ETS.
    - Emissions reductions modelled indicated reductions in total agricultural emissions of less than 1% reduction in both CH4 and N2O below 2017 levels, additional to reductions as a result of other environmental policies (the alternative pricing proposal recycled revenue to help innovate and drive a transition).

24. Modelling by the HWEN Programme Office in 2022 showed that putting agriculture into the ETS would result in modest emissions reductions, a drop in production, and a loss of profits (most heavily to the sheep and beef sector). [3]

	CH_4 price ($/kg CH_4)	LLG Price ($/t CO_2-e)	CH_4	N_2O	Milk	Sheep & Beef Meat	Dairy Profit	Sheep & beef profit	Gross levy revenue ($m)
2025	$0.11	$4.25	-0.2%	-0.2%	-0.5%	0.0%	-1.7%	-5.9%	$136
2030	$0.35	$13.80	-0.8%	-0.5%	-1.8%	-0.1%	-5.5%	-17.5%	$426

25. A farm-level levy has been agreed by Government, following extensive analysis and development work by HWEN, consultation with farmers, input from the Climate Change Commission, and the Government's own engagement processes. Therefore, we seek urgent removal of the ETS backstop to

[3] FINAL-Pricing-agricultural-GHG-emissions-sectoral-impacts-and-cost-benefit-analysis.pdf (hewakaekenoa.nz)
Modelling is based on the assumed NZU prices in 2025 ($85/t CO2-e) and 2030 ($138/t CO2-e), with 95% and 90% allocations in 2025 and 2030 respective.

price agricultural greenhouse gas emissions. The ETS is not fit for purpose for agricultural emissions and does not make sense practically, scientifically, nor economically.

Nāku iti noa, nā

David Burger
General Manager, Sustainable Dairy
DairyNZ

Review of the NZ ETS: Discussion Document - SUBMISSION

Submitter Details

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My interest in this review comes from being a part time sheep and beef farmer (4ha near Hamilton and 56ha at Taumarunui) and as a self-employed agronomist specialising in soil fertility issues, providing consultancy services for farmer clients and agricultural based companies over the past 34 years.

I am currently a paid up member of the following professional scientific organisations with the approximate period of membership in brackets:

- New Zealand Institute of Agricultural and Horticultural Science (20 years)
- New Zealand Grassland Association (30 years)
- New Zealand Institute of Primary Industry Management (3 months)
- New Zealand Society of Soil Science (28 years)
- British Society of Soil Science (22 years)
- Institute of Professional Soil Scientists – UK (22 years)
- Brookside Society of Professional Consultants – US (27 years)

Introductory comments on the NZ ETS Review

It has been good that the current government has opened up this review on the ETS to ascertain if it is fit for purpose and what needs to be changed for the betterment of our country and ultimately the world in achieving the desired goals of reducing the impact of anthropogenic global warming. I have worked in the soil science and agronomy workspace in both research and consultancy since graduating from Lincoln in 1978, for approximately 45 years, and the notion that the science on any subject is ever settled, let alone climate change, is wrong. Real science progresses through and embraces falsification. Some of the underlying 'science' driving the ETS, recent data and research has shown to be false, which has a major bearing on the wholesale conversion of hill country pasture to forest which I intend to highlight. It is the science that I am principally interested in and make my submission based on this, more than any financial or social effect that changing the NZ ETS may have. Any government or government department that fails to embrace new science as it comes to light, does a huge disservice to its citizens with disastrous outcomes for future generations.

In the latest IPCC AR6 Report of April 2023, Chapter 7 (The Earth's Energy Budget, Climate Feedback and Climate Sensitivity), p 1016 states: *By comparison expressing methane emissions as CO2 equivalent emissions using GWP-100 overstates the effect of constant methane emissions on global surface temperature by a factor of 3-4 (Lynch et al 2020), while underestimating the effect of any new methane emission source by a factor of 4-5 over the 20 years following the introduction of the new source (Lynch et al, 2020).*
https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07.pdf

The reference for Lynch's work can be found here
https://iopscience.iop.org/article/10.1088/1748-9326/ab6d7e/pdf

This has huge ramifications for the biogenic methane emissions from livestock which it has been claimed is responsible for approximately half of New Zealand's GHG emissions. This latest report shows that this is a flawed concept, and that in fact biogenic methane totals only a very small fraction of our current impact on global warming. Our gross biogenic methane emissions today are no higher than in 1990 as livestock numbers overall have not risen, with the amount of extra methane produced by the increase in dairy cow numbers since 1990 being less than that produced by the dramatic drop in sheep numbers over this same period. Methane completely breaks down over 28-30 years, so biogenic methane produced today has no impact on global warming as it is only replacing what was emitted 30 years ago.

To quote from the Lynch report referred to above:
For methane, concentrations increase rapidly but then plateau after a few decades as natural atmosphere removals balance ongoing emissions. Radiative forcing similarly increases rapidly due to the high radiative efficiency of methane (i.e. there is a large change in forcing per change in CH4 concentration) but then largely stabilizes.

The warming from any biogenic methane emission would also be expected to completely stabilise and generate no additional temperature increases, becoming indistinguishable from long standing natural methane emission rates to which the climate system has fully adjusted.

For CO2 modelling an equivalent (GWP-100) emission scenario, we see that sustained (CO2) emissions do not result in stabilising concentrations. Instead, concentrations, forcing and subsequent warming continue to increase for as long as the emissions are sustained. This highlights how different short and long-lived GHGs are, and hence why metrics that attempt to treat them in the same way fall short.

The ETS currently does not distinguish the long term warming effect of methane and CO2, putting them both in the same category, yet this science shows this is wrong.

In the Conclusion section of the Lynch report it states:
Using GWP-100 to direct climate change mitigation strategy could be unfair, inefficient and dangerous. Unfair as it does not provide a clear link between emissions and climate change contribution, and could lead to an expectation that some actors (long term methane emitters) have to undo their past warming, while others (CO2 emitters) merely have to limit further temperature increases….There is an additional danger, which is to the perceived environmental integrity of climate policy. Basing climate policies and emission trading systems on a metric which demonstrably fails to reflect the impact of different emissions on global temperature, while at the same time claiming these are designed to deliver a long-term temperature goal, risks undermining confidence in the entire strategy.

The above conclusion from the latest scientific modelling should cause the NZ Government and government Departments to review not only the ETS in relation to forestry, but our obligations as a country to meet our Paris Climate Agreement obligations of 2016 which were ratified at the UNCCC (COP21). For some reason, this latest research and conclusion of 2023 IPCC AR6 Report has been ignored (or maybe not yet discovered) by our media or bureaucracy. Its impact is significant on our economic future and well-being, and shows the current ETS is not fit for purpose and needs a major overhaul, well beyond the questions raised in this current review.

Atmospheric physicists Wijngaarden and Happer have shown that the radiative forcing and subsequent warming effects of the various greenhouse gases has been exaggerated with the IPCC dry atmospheric models, whereas their real world data where water vapour which is the major

greenhouse gas in the atmosphere is included, we discover the warming effects of these GHGs is significantly lessened. Here is a link to but one such technical paper by these two physicists challenging the historical IPCC models on which the ETS and our Climate Change narrative is based. https://www.researchgate.net/publication/341997882_Dependence_of_Earth's_Thermal_Radiation_on_Five_Most_Abundant_Greenhouse_Gases

It is with this background that I will answer the questions you are asking submitters to respond to.

Consultation Questions

2.1 With the above background information, the supposed reductions and removals that the NZ ETS are expected to drive are flawed for the short, medium and long term. Furthermore, with sheep and beef production being replaced by trees, and because our sheep and beef farmers are more carbon efficient than anywhere else in the world, the sheep and beef no longer produced in New Zealand will be produced elsewhere in the world with higher GHG losses, resulting in a net increase in GHGs worldwide.

There has also been an overlooked area of science when it comes to carbon sequestration nationally which is what is happening in our native forests. Some research undertaken over the past 30 years by over 100 scientists, led by Leeds University researchers has shown that since 1980 the Amazonian rainforests have absorbed around 420 million tonnes of carbon annually, which is equivalent to four times the total UK emissions of 2016. https://phys.org/news/2017-02-carbon-uptake-amazon-forests-region.html It had previously been thought that permanent forests were in a steady state situation as far as carbon was concerned and were not growing any bigger. This research over several decades has shown this not to be the case, but that increased CO2 levels in the atmosphere has meant increased plant food for these forests, which have been growing bigger, and that for nine of the Amazonian countries the amount of sequestration of these forests in their territories has more than covered any anthropogenic emissions they have produced. This research has significant ramifications for New Zealand, as we have large swathes of our total land area covered in native bush or indigenous forests. It could well mean that as a nation we are net carbon sequestering rather than emitting, and that these native forests are not in a steady state but are continuing to grow. Another possible cause for continued carbon sequestration in our forests may be global warming, which is of particular significance to our native forests in Fiordland, Stewart Island and some of the cooler alpine regions in both the North and South Islands where warmer temperatures would encourage more plant growth and carbon absorption. Temperature increases are unlikely to affect tropical rain forests, but our temperate native forests should benefit. Taking into account carbon sequestered in these areas, plus other uninhabited islands belonging to New Zealand such as Auckland Islands where tree growth is likely to be advancing could be an economic windfall. It is in our national interest to investigate whether there is any continuing carbon accumulation in our native forests from the higher atmospheric carbon dioxide levels.

2.2 As I work in the farming sector with over 300 clients, their overall outlook for the future is a lot more gloomy than what it was a decade ago, as they are continually demonised by MSM and climate alarmists for the methane their livestock naturally produce. This constant pressure is causing young farmers to seek a different future to farming, and that the future of continued intergenerational farming is fast becoming a rarity. For older farmers, with no children wanting to continue farming, they are reluctantly selling their heritage to overseas or corporate companies who have no interest whatsoever in the improvements and facilities which have been built with blood sweat and tears over the generations, but who will now plant trees and walk away.

2.3 In the King Country region where I live, there has been over 12,000ha of farmland which has been sold to go into trees over the past 5 years. Three of these properties have been purchased by an Austrian billionaire who has no interest whatsoever in the land or our nation, but has just purchased these to make huge returns from our ETS. Like the much discussed 5000 hectare Huiarua Station north of Gisborne which was sold to the owners of the Swedish company IKEA last year, these foreign investors will reap financial windfalls which all kiwis will be contributing to via fuel and energy taxes. Although there were good offers by NZ farming enterprises for Huiarua Station, they could not compete with the deep pockets of these overseas tycoons, and the sellers of these properties will usually take the highest offers. I personally know of a young farmer looking to buy a hill country property, but they can only afford to pay $10,000/ha whereas deep pocketed carbon enterprises are paying $15,000/ha for farmland.

A 3000 acre property I am familiar with only 15 km from the Waitomo caves sold several years ago to a carbon farming enterprise and has been fully planted in trees. There were five houses in which five farming families once lived and two lots of woolsheds and cattle yards along with good fencing and races for stock control. My estimate is that well over half of this property was good Class 3, 4 and 5 soils, which are allophanic and highly productive, but is now forever lost to trees. To prevent such good pastoral land going into carbon farming in the future, the government should insist that carbon farming be restricted to Class 6, 7 and 8 soils, and that the more productive parts of these larger farms remain in pastoral agriculture so that future generations can benefit from its productive potential.

To answer another part of your question, I have a sheep and beef farming client near Wairoa who has designated about 20% of his steeper less productive land to be planted in trees and entered into the ETS. As he is still a relatively young farmer, he is looking at radiata pines as they will give a much greater return in a shorter period of time compared to other trees or natives on this part of his farm.

2.4 I generally agree with the summary of the impacts of exotic afforestation. What was not highlighted enough will be the devastation that any form of afforestation (not just exotics) will have on small rural communities such as Taumarunui where I currently live, compared to pastoral farming. A plant and walk away policy which carbon farming creates, will severely impact on rural employment. Where there are farming families, they use the services of local businesses which keeps rural towns going. Back in 2011 Dr Don Brash, the Reserve Bank governor stated that every farm worker created over $300,000 GDP, whereas every worker in tourism only created $60,000 GDP. The wholesale planting of trees will be the death knell for many rural communities and businesses.

In this summary, the threats of wild fires and wilding pines are mentioned. The fire threat is non-existent in pastoral farming, but very real for trees. The loss of all the accumulated carbon from a fire will mean that the land will have gone back to square one. Will the landowner who has accumulated wealth through NZUs have to pay all of the money back? How will the government get such moneys back if the person or enterprise no longer exists in say 25 years time? Who will have to pay for the replanting of the land with trees which have been burned down and released all of their accumulated carbon back into the atmosphere? It can also create rates issues for local councils as the land owner has no obligation to continue paying these once they have collected their income from NZUs from the previous decades, and again could bankrupt or shut down the legal entity or company which originally purchased the land.

As for wilding pines, it beggars me that the government is spending tens of millions of dollars trying to control wilding pines in parts of the South Island high country, when this land is totally unproductive and is not producing any benefit for NZ Inc. Leaving these wilding pines to grow and

sequester carbon from the atmosphere makes more sense, and the need to convert productive farmland into trees will go away as we will meet all of our international obligations with these wilding pines. This link from the DOC website https://www.doc.govt.nz/nature/pests-and-threats/common-weeds/wilding-conifers/ states that 20% of New Zealand will be invaded by wilding conifers in 20 years unless drastic action is taken. They currently cover 1.8 million hectares and are growing at a rate of over 70,000 ha annually. Much of this invasion is on DOC land and millions of dollars of public money is being spent every year in what appears to be a losing battle to control them. Could these wilding pines be a blessing rather than a curse? Any national greenhouse accounting needs to consider the economics of cutting these down versus leaving them alone to cover whole hillsides as can be seen from the photos from Mid Dome in Southland on the website referred to above, and then claiming international carbon credits from them. The barren landscape of 20 years ago is now a deep green. It may not be what DOC desires as it tries to protect alpine landscapes, but wilding pines can have a silver lining to them in terms of carbon sequestration. Where wilding pines are growing on privately owned commercial properties, then these private land owners have the option of using them as an income source through the ETS, or if they are an unwanted pest weed, then they can kill them at their own cost as these wilding pines will be interfering with their pastoral farming ambitions and it is in their economic interest to get rid of them.

3.1-3.3 When it comes to ETS pricing to drive emissions down, our CO2 emissions are already reducing when it comes to energy as more and more people convert to electric cars, and as more renewable energy sources for electricity come on stream and reliance on the coal fired generation at Huntly and our dairy factories is phased out. Fonterra are changing their factories from coal fired to renewable energy sources over the next decade. As already elucidated above, the biogenic methane from livestock has been over-exaggerated by 3-4 times, so is a non-issue, and as technologies become available, farmers will embrace and use technologies to further reduce methane and nitrous oxide emissions, and will also breed animals which emit lower amounts of GHGs. Having a big stick and creating high prices for NZUs will impact on society as it takes the wealth off everyone, including low income families who cannot afford electric cars or solar power energy systems, and gives it to wealthy foresters and a global or tribal elite who can afford to buy land and plant it in trees.

4.1-4.4 With Maori who do have significant land holdings, often in remote and less productive areas, the ETS does offer a great income source for much of this marginal land, but there is the internal conflict of wanting to make quick money with fast growing exotics, versus planting slow growing natives which will be a financial burden for many years before any serious economic returns could be made. Who knows, in 30, 40 or 50 years time the whole ETS money-making venture could be shut down, so their native plantings will have produced little income. Another issue which this review highlights is the conflict between the desires and benefits a tribal Maori elite may gain from the ETS at the cost to urban Maori with no tribal connection who are often financially poorer than the general populace, and yet who will be having to pay the extra taxes on petrol and energy to warm their homes or drive their cars, like everybody else, which will be funding the ETS. Increasing NZUs will impact on the poor urban and rural Maori harder than the wealthy tribal elite.

5.1-5.5 I agree that the NZ ETS should support more gross emission reductions by incentivising the uptake of low emissions technology. As a current example there is a rebate on the purchase price of new electric cars, which we personally have taken advantage of and have just purchased a new hybrid car which qualified for a partial rebate. On the other hand I also drive a 4WD diesel ute which I need for my farming business and also for driving around farms taking soil tests. I purchased this before the recent $5000 ute tax came into force, but for other business people who need such a vehicle, having to pay an extra $5000 tax appears to be rather onerous.

Another option which should be available in the not too distant future is hydrogen powered vehicles which will also help reduce our reliance on fossil-fuelled transport, particularly in the heavy trucking industry which is responsible for moving much of our goods around the country. There seems to be a reluctance for the government to use rail as much as it could. Here in Taumarunui we have a new hi tech pet food factory which will soon be processing pet food at the rate of 12 tonnes per hour, 24/7, much of it being exported, for which they are currently totally reliant on trucks delivering inputs and taking outputs. Yet there is an adjacent rail system which could do this more efficiently, but requests to Kiwirail and government bureaucracy to assist in making this happen have so far fallen on deaf ears. Prioritising electric rail to deliver competently and competitively priced transport of goods and materials compared to diesel powered trucks should be a priority for our NZ government owned enterprise, Kiwirail.

6.1-6.6 Of the options given I prefer option 4 as it has more government control, and the government can control the number of units available and drive the price, depending on how the economic conditions of the country are at the time. Obviously a high price will more severely impact low income families and with a higher portion of Maori than non Maori in this category, the government at the time can consider this impact when releasing NZUs available to purchase.

7.1-7.4 I am not convinced that indigenous afforestation should be incentivised, as they take many decades to remove any significant amount of carbon from the atmosphere, and it would be more beneficial to use harvestable trees which future generations may be able to harvest and export to gain income from, and once that wood is overseas, they can replant the land similar to what plantation forestry has been doing for many decades. This will provide employment opportunities for future generations to make income off, whereas permanently planting it in slow growing indigenous forest will prevent future generations using such land for any economic benefit, except a slow amount of money for carbon sequestered via the ETS for the owner(s). For this reason I am principally against the idea of carbon farming where there is no future prospect of being able to harvest the trees. Maybe on unharvestable class 6 or 7 soils in remote areas, the planting of natives could be considered. However natives do require a lot more effort and long term maintenance due to invasive weed species which may choke them out, and also are more susceptible to pests such as hares, possums, goats and deer. On my own farm, I have a steep southerly face which I would like to plant in hardwoods and enter the ETS, but there is a large and growing mob of feral deer which come out from neighbouring pine forest on one side, and a native bush block on the other side, and I fear that all the effort and expense of me planting these hardwoods would be wasted as the deer would destroy the young trees. Because of these ungulate pests I am resigned to leaving this area in pasture. Natives would certainly not be an option for me with these pests.

Radiata pine is a monoculture species, and it produces phytotoxins in the root zone which discourages other plant species from growing in its vicinity. Native species do not appear to produce these phytotoxins and therefore there is much greater diversity of species in native bush once it becomes established. There is this conflict between the benefits of planting exotic species versus indigenous species, and really this should be determined by the land owners themselves and their preference, as both can have environmental benefits and trade-offs, but the economic benefits of planting exotics over natives under the ETS should remain, as they are much more efficient and effective in removing carbon from the atmosphere.

I finish with an interesting quote from retired MIT atmospheric physicist Professor Richard Lindzen:

'What historians will definitely wonder about in future centuries is how deeply flawed logic, obscured by shrewd and unrelenting propaganda, actually enabled a coalition of powerful special interests to convince nearly everyone in the world that CO2 from human industry was a dangerous planet-

destroying toxin. It will be remembered as the greatest mass delusion in the history of the world – that CO2, the life of plants, was considered for a time to be a deadly poison'.

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8 August 2023

Consultation Response

Te Arotake Mahere Hokohoko Tukunga, Review of the New Zealand Emissions Trading Scheme

Submitters

Carbon Forest Services is a specialist consultancy working with forest owners, including farmers, local governments, iwi, and not-for-profits on maximizing value while avoiding the risks associated with the Emissions Trading Scheme (ETS). Carbon Forest Services represents participants in the ETS who collectively own over 40,000 hectares of registered forest.

Response overview

We are overall disappointed with the content and timing of this consultation. We believe that the changes outlined in this consultation are vague and unclear. Therefore, due to the lack of specific targets and well-defined objectives, Carbon Forest Services is unable to comment on the options put forward in this consultation. We are surprised that this consultation was released without first refining objectives and options with relevant experts and stakeholders such as the forestry Technical Advisory Group (TAG). We also struggle to understand the timing of this consultation: it is staged in the midst of an election year and during a time of important changes to the ETS, some of which have not even been fully implemented yet.

Therefore, we strongly urge the Government to stop this consultation and start again in the following order:

1. **First, determine what role forests should play in the ETS** (e.g., how many hectares and over what period of time). Engage with stakeholders then publicly consult on the best options.

2. **Then, design how forestry should participate in the ETS** (e.g., status quo or separate mechanism)**.** Engage with stakeholders then publicly consult on the best options.

We also believe any major changes to forestry should not be retrospective. To reinstate confidence in forestry and the ETS, we strongly urge the Government to immediately announce that changes will apply only to forests registered in the ETS after 1 January 2026 and will not affect existing forests.

Consultation Response

Provided on the following pages is our consultation response. We welcome the opportunity to discuss our submission further with officials.

Regards,

Ollie Batelier-Belton
Managing Director
[redacted]

Mathilde Batelier-Belton
Director and General Manager
[redacted]

1. The objectives must be defined.

This consultation does not outline the Government's objectives or targets for afforestation, forest management and the place of forestry in the ETS. The only targets outlined are focused on the reductions of greenhouse gas emissions for New Zealand, and our international commitments by 2050. This is damaging to the carbon market and is negatively impacting the forestry sector. Without clear objectives, we are unable to submit a more focused response, particularly on the four options presented.

This consultation must be more specific regarding afforestation and land use objectives. This includes clear targets, firstly around the amount of carbon removals the country wants to achieve through forestry; and secondly, how it wishes to reach those goals, i.e., how many hectares must be planted, what tree species, where and the timeframe associated with those targets. These elements are critical to restore and retain confidence in the carbon market, and ultimately, meet our wider carbon emissions reductions objectives.

Finally, we believe the discussion document frames the exotic "forestry issue" in a narrow-minded way which favours agriculture. The environmental challenges associated with exotic forestry are far outweighed by unsustainable agriculture, such as greenhouse gas emissions, water pollution, soil erosion and biodiversity loss.

2. The timeframe for this consultation is poor.

New Zealand is not on track to meet its greenhouse gas emissions reduction, either gross or net. The narrative of the ETS is that it is the main tool to reduce Aotearoa's greenhouse gas emissions. It has been in place for 15 years and yet has been failing at this task spectacularly as the country's emissions have continued to rise faster than in most developed nations.

We struggle to understand how such an open-ended and objective-less consultation was brought forward. In the context of the current carbon market volatility, the poor decisions the Government has made in the past 12 months and the current uncertainty and lack of confidence in the carbon market, it is concerning to witness such a lack of awareness of key contextual elements. This consultation reinforces uncertainty in the ETS at a time when climate change and its devastating impacts are accelerating, and therefore it only delays climate action, both domestically and abroad.

The Government has indicated, under the advice from the Climate Change Commission, that it supports the objective to prioritize the reduction of gross emissions while maintaining support for removals. We agree with and encourage the implementation of this objective. However, this must not weaken forestry nor create uncertainty in the carbon market. The Government must send a strong message of what the objectives are for afforestation and carbon removals as we specified above, and how they will be achieved in the future, so every stakeholder can plan and strategize accordingly.

One of the key questions remains: how fast does Aotearoa actually want to act to reduce carbon emissions? Many of the consultations in the past 12 months have only brought more uncertainty and skepticism in the ETS through their lack of specific objectives, and lack of timeframes.

The Government must lead and position itself more clearly.

Finally, we acknowledge that the agricultural sector has a different process through He Waka Heke Noa. However, it is difficult to read a consultation that aims to change ETS settings to accelerate emissions reductions, whilst the Government has not yet released a final pathway on how to reduce 50% of Aotearoa's greenhouse gas emissions linked to the agricultural sector. This is an important oversight when this consultation asserts that exotic afforestation will bring a surplus of units in the long run. ETS forestry participants, who have contributed to lower the net carbon emissions of Aotearoa for 15 years through carbon sequestration, should not pay the price to be pushed into higher costs and economic uncertainty when a large part of gross carbon

emissions remains unaddressed to this day.

3. This consultation has failed to set a clear signal that existing ETS forestry participants will not be impacted by future changes

Any future decisions must be made after having been discussed in a constructive and transparent way with key stakeholders from the relevant sector. This can be done through existing stakeholder groups, such as the TAG, or through newly created groups. This consultation has been released without consulting with any experts. It is therefore difficult to support any option which has not been adequately discussed and refined in the first place.

Furthermore, this consultation and subsequent webinars have been unable to answer the key question on whether current ETS forestry participants will be grandfathered into those proposed changes.

Therefore, Carbon Forest Services is not in a position to support any option brought forward in this consultation due to the lack of technical policy details and stakeholder consulting. We consider that it is too premature and irresponsible to support any options at this stage.

We welcome the opportunity of submitting a new consultation response after the Government has worked with stakeholder groups.

4. Future changes should be implemented at the earliest from January 2026

This consultation misses the importance of not damaging investment confidence of ETS participants, which includes forest owners, emitters, and market makers who have been committed to this space for more than a decade. This is a key element of ensuring the success of the ETS.

New Zealand has a strong reputation for investment confidence which this consultation has greatly eroded. ETS confidence has tumbled to a decade low with the NZU price halving and increased volatility. Investment confidence needs to be restored as soon as possible to incentivize both net and gross carbon reductions. To this end we strongly advocate that current forests should largely remain unaffected by policy changes on forests role in the ETS, and that new policies should be targeted towards new forests established from 2026 onwards.

11 August 2023

NZS review
Ministry for the Environment
PO Box 10362
Wellington 6143

Redesigning the NZ ETS permanent forest category consultation
Ministry for Primary Industries
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Tēnā kōrua

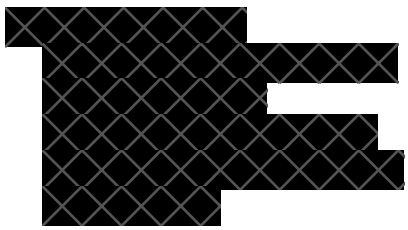
JOINT FEEDBACK ON THE REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME DISCUSSION DOCUMENT AND THE REDESIGNED NZ ETS PERMANENT FOREST CATEGORY DISCUSSION DOCUMENT

Thank you for the opportunity to provide feedback on both the review of the New Zealand Emissions Trading Scheme discussion document and the redesigned NZ ETS Permanent Forest Category discussion document. Our feedback on each discussion document is summarised in the attached appendices.

Many thanks for the opportunity to provide feedback on both discussion documents and potential changes to the NZ ETS.

Ngā mihi,

Iain Maxwell
Group Manager Integrated Catchment Management



APPENDIX ONE – FEEDBACK ON THE REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME

Ref	Question	Feedback
2.1	Do you agree with the assessment of reduction and removals that the NZ ETS is expected to drive in the short, medium, and long term?	-
2.2	Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?	-
2.3	Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?	- Yes, volatility in carbon prices increases the risk for investors/farmers and decreases uptake – ref Land for Live pilot farm processes and associated farmer/market engagement. Lower carbon prices disincentivise an appropriate mix of 'right tree right place' behaviour, favouring faster sequestering varieties over indigenous plantings in the mix of appropriate tree mix selection at the farm and catchment scale
2.4	Do you agree with the summary of the impacts of exotic afforestation? Why/why not?	Yes, the council agrees with the impacts on land-use change and flexibility being limited by permanent forestry.
3.1	Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.	Yes, driving gross emissions reductions through the revised ETS should encourage industry sectors to invest in low-emissions technology and infrastructure, reducing gross emissions (if priced correctly). Ultimately emissions reductions are more beneficial than removals and carrying on under BAU.
3.2	Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?	Yes, higher NZ ETS prices should encourage reductions in gross emissions through industry switching to low-emissions technology or infrastructure as the most cost-effective decision. However, the price of the NZ ETS cannot be increased too high as this could also cause a shift in production offshore to countries without emissions-pricing policies. Reduced volatility and stable policy settings are needed to de-risk investment and improve uptake of afforestation
3.3	How important do you think it is that we maintain incentives for removals? Why?	Very important. Though removals are not emissions reductions, they do play a significant role in helping reduce our net emissions, until emissions-reducing technologies are widely available and affordable and until sectors have transitioned to lower emissions practices. In the future there is a need to look at the promotion of indigenous forest afforestation (as a removal) to provide long-term permanent forest sinks alongside multiple outcomes such as biodiversity goals, natural hazard mitigation, and climate change adaption/mitigation/resilience. Incentivise native afforestation by paying more carbon credits for native.
4.1	Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?	Māori hold a substantial proportion of land that is marginal, however suitable for afforestation. There should be more incentives to support indigenous afforestation, protection, and regeneration. The current ETS incentivises pine forestry on this land and does not show value of existing important indigenous forests.
4.2	What other interests do you think are important? What has been missed?	-
4.3	How should these interests be balanced against one another or prioritised, or both?	-

4.4	What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?	Large tracts of whenua Māori contain indigenous forest, this should be rewarded and supported financially, helping promote indigenous afforestation on marginal land.
5.1	Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?	Yes, emissions reductions are the most important outcome for long-term emissions targets and should be prioritised. Removals (forestry) are still key in managing short-term net emissions and are also an important industry here in NZ.
5.2	Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?	Yes, reductions in emissions are where long-term gains are found. Removals are an important short-term tool but not the long-term solution. This would also mean we would deal with emissions 'quickly' instead of delaying emissions reductions which would inevitably have to be implemented (as removals cannot continue to keep up). Supporting the education and supply chain constraints for resilient afforestation methods will increase uptake.
5.3	Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?	Agree in part - the NZ ETS should in the first instance prioritise emissions reductions. Removals play a key role in short to medium term, but not the long-term solution. Additionally, the ETS should drive these solutions in a way that ensures mass afforestation is not carried out inappropriately or seen as an 'easy default' when it comes to carbon management.
5.4	Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.	-
5.5	Are there any additional criteria or considerations that should be taken into account?	Additional criteria could include multi-benefit nature-based considerations such as indigenous afforestation which supports emissions removals and biodiversity outcomes, or wetland restoration/creation supporting biodiversity, emissions removals, and flood attenuation. Healthy wetlands are known to store vast amounts of carbon due to anaerobic processes which enable accumulation of organic matter in the soil. Although they only cover about 3% of the earth's land surface, wetlands store twice as much carbon as all the world's forests combined[1] (31% of the earth's land surface). Drainage of wetlands for agriculture, urban expansion and other developments has led to the release of carbon into the atmosphere[2]. Restoring wetlands, therefore, is an effective way to facilitate long-term carbon storage.
6.1	Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?	Option 4 – see further elaboration in 6.3
6.2	Do you agree with how the options have been assessed	Yes, the review of each option has a summary that looks at the impact of each option on each of the considerations outlined in chapter 5.

[1] https://www.eli.org.nz/research-legal-cases/managing-wetlands

[2] Soil carbon stocks in wetlands of New Zealand and impact of land conversion since European settlement (2015)

	with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.	
6.3	Of the four options proposed, which one do you prefer? Why?	Option 4. This prioritises emissions reductions aligning with the primary objectives of this review. Option 4 creates two separate markets for both reductions and removals, allowing both to play a role. Prioritising reductions, while still incentivising removals (depending on price).
6.4	Are there any additional options that you believe the review should consider? Why?	-
6.5	Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?	-
6.6	Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?	-
7.1	Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?	Yes, incentives should be strengthened to prioritise removals with environmental co-benefits helping meet multiple environmental targets/outcomes.
7.2	If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?	Either option 2 or option 3.
7.3	Should a wider range of removals be included in the NZ ETS? Why/Why not?	Yes, the restoration and re-creation of wetlands that provide both emissions removals, biodiversity outcomes, and flood attenuation.
7.4	What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?	-

APPENDIX TWO – FEEDBACK ON THE REDESIGNED NZ ETS PERMANENT FOREST CATEGORY

Ref	Question	Feedback
1	How do you think the Inquiry's recommendations should be reflected in proposals to redesign the permanent forest category?	The inquiry heavily criticised the management of highly erodible land in part of our region and emphasised the importance of indigenous forest[3]. Redesigning the permanent forest category to more effectively incentivise indigenous vegetation would have many co-benefits for biodiversity. Part of this needs to be practical and economically viable ways of transitioning existing exotic forest to indigenous forest.
2	Do you agree with our assessment criteria for the redesigned permanent forest category? If not, what would you change and why?	Agree in part – there is an issue with ongoing funding and economic viability for active long-term management of permanent forests. There will need to be incentives for future investment for clean-ups and tree management in the longer term including as forests are subject to future storms, pest control, fire and other land use related issues such as windthrow and erosion, off-site forest debris impacts, and impacts on infrastructure.
3	Do you think any of these criteria are more important than the others? If so, which criteria and why?	All the criteria relate and support each other. It is difficult to specify one as more important than another due to their inherent interconnectedness. Additionally, criteria 1 specifies indigenous forests while 2 through 5 do not specify what type of permanent forest. This question is not overly useful.
4	Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered?	Option 1.2. This option still caters for exotic forestry, providing some restrictions. It also promotes indigenous afforestation in other non-restricted areas and transition forestry. This would seem to promote both short and long-term emissions removals alongside environmental gains. (Discuss the ideal vs. reality)
5	If you support allowing exotic species under limited circumstances, how do you think your preferred 'limited circumstance' should be defined?	Limited circumstances should relate to location and land-type e.g., highly erodible land (geology), longevity of tree species, location of waterways, size (mosaic planting), percentage of exotic forest within the region, etc. Driving whole farm afforestation is not good, we need to retain our productive pasture land. There should be ongoing support provided for spaced planting where it appropriately protects soil erosion, maintains productive pasture land and increases carbon sequestration.
6	Do you think there is an opportunity to use permanent forests to stabilise erosion-prone land?	Yes, however permanent forests on erosion-prone land (erosion-prone land assumes definition as of LUC 6-8) should be restricted to indigenous forests (Evidence following Cyclone Gabrielle concluded in northern Hawke's Bay exotic forestry was less effective than predicted, reducing landslide probability by 60%, while indigenous forest maintained a normal reduction of 90%)[4]. There is extra difficulty and risk with establishment of indigenous forests and landowners would need extra support to ensure successful establishment, this needs to be recognised as important for future emissions budgets.
7	Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?	Yes, this makes sense. Ideally, we would not be establishing permanent exotic forests that threaten to permanently alternative ecosystems, impact on grazing land, use water resources, and provide habitat for pest plants and animals.
8	Do you agree with the proposal for a specific carbon accounting method for transition forests? If you disagree, could you please provide the reasons why? If there are other options you think we should consider please list them.	Yes- there is significant risk associated with transition forests, especially with uncertain economics. Need to ensure will still be successful, especially if active management to transition is required in case carbon price falls or landowner walks away. Support for fencing/pest control of existing native remnants is important, it builds understory, providing for long-term protection and increase of the carbon sink capacity of the existing remnant forest. It also provides locally sourced seed and biodiversity to be naturally spread to neighbouring regenerating areas.

[3] https://environment.govt.nz/assets/Outrage-to-Optimism-CORRECTED-17.05.pdf

[4] https://environment.govt.nz/assets/Rapid-assessment-of-land-damage-Cyclone-Gabrielle-Manaaki-Whenua-Landcare-Research-report.pdf

9	If you agree with the proposal for a specific carbon accounting method for transition forests, what do you think it needs to achieve?	Needs to provide security and less financial risk to the participant. The proposal needs to incentivise transition forests by providing less financial risk to the participant.
10	What do you think should occur if a forest does not transition from a predominately exotic to indigenous forest within 50 years?	They could incur penalties on carbon credits earned, or not receive any carbon credits to incentivise biodiversity outcomes. Another option could be implementing a 'bond' system
11	Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered?	Option 3.2. This provides for all registered permanent forest categories which considers the differing requirements associated with each of the categories (e.g., pest control, weed control, fire risk etc). In the NES-PF, setbacks from wetlands and protection for SNAs are required. There needs to be similar mechanisms for transition forests
12	if there were to be additional management requirements for transition forests, what do you think they should be for? Why?	-
13	Do you think transition forests should be required to meet specific timebound milestones to demonstrate they are on a pathway to successful transition?	Yes. There should be a management plan where proposed timelines are met.
14	Do you agree with this proposal to allow transition forests to be permitted to clear-fell small coupes or strips to establish indigenous species? Why? And if you agree, what other restrictions should there be?	Yes. This is necessary to encourage indigenous plant growth. Additionally, needs to be consideration for risk of sediment entering waterways.
15	If forest management requirements are implemented, do you think these should be prescriptive or outcomes-focused? Why/Why not?	Outcomes focused. Location and forest types will be different, the management approach should reflect this (such as pest and weed control etc). There could also be a standardised timeframe for transition from exotic to indigenous, but management should be able to choose within such a timeframe what best suits.
16	What are your views on forest management plans?	Forestry management plans should be introduced for permanent forests.
17	What should forest management plans include?	Monitoring and managing risks, ensuring outcome focussed approaches, and a plan for transition if applicable.
18	Who do you think should be allowed to verify and/or monitor forest management plans?	-
19	How often do you think forest management plans should be re-verified?	-
20	What do you think should happen if there are not enough people to verify forest management plans?	-
21	Do you think the use of existing compliance tools are appropriate?	No- currently compliance can only charge a certain number of visits and therefore focus on high risk (e.g.: harvesting). Being able to do more at the afforestation stage would make a big difference to protection of wetlands etc
22	Do you think there should be new or expanded compliance tools for permanent forests? Which ones and why?	What tools are available for compliance officers to figure out the % of indigenous (e.g., 10% basal area made up of indigenous by year 10)?

23	Are there other compliance options that you think we should consider?	Transition forests: due to the elevated risk of uncertainty and the variation, **one compliance regime will not fit all**. For example, not reaching a certain % by a certain time might not be due to lack of trying – may be other factors that are out of their control. Transition forests success will vary based on location, seed sources, exotic species (issue of resprouting), pests, weather events etc.
24	For the compliance tools you think we should have, when do you think they should be used?	-

Firstgas Group

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11 August 2023

Ministry for the Environment
PO Box 10362
WELLINGTON

Delivered via email: etsconsultation@mfe.govt.nz

To whom it may concern

Review of the New Zealand Emissions Trading Scheme

Firstgas Group welcomes the opportunity to comment on the Ministry for the Environment's (the Ministry) consultation paper "*Review of the New Zealand Emissions Trading Scheme (NZ ETS)"* released on 19 June 2023. Firstgas Group is making this submission on behalf of Rockgas who have direct ETS obligations and other businesses within our group which have indirect obligations under the NZ ETS. An overview of Firstgas Group is provided in **Attachment 1**. There is no confidential information in this submission.

Firstgas Group strongly supports the submission made by Business New Zealand and the Business Energy Council. Their submission describes the high value that should be placed on providing more certainty and confidence in the ETS. Our submission emphasises this theme.

We support New Zealand's net zero emission reduction target and we recognize that this involves a balance between gross emission reductions and emission removals. We view cross-party support for the Climate Change Response (Zero Carbon) Amendment Act 2019 and carbon budgets as immensely valuable for creating consistent and fundamental parameters that enable organisations to make investments to reduce emissions. We support the ETS as the primary mechanism to do the 'heavy lifting' of emissions reductions, with complementary policies augmenting action.

Above all, we urge the government to rule out any retrospective changes, particularly concerning existing NZU rights. Policymakers should ensure they look beyond the short-term effect of retrospective changes and account for the extreme detriment that undermining investment decisions has on future decisions. It is crucial that businesses have confidence to make informed, long-term investments in alignment with shared climate goals.

We oppose the proposed devaluing of emissions removals (relative to gross emissions reductions) within the NZ ETS framework. Focusing on gross emissions reductions does not align with NZ's cross-party net-zero emissions target and undermines the value of emissions removals in our country's comprehensive climate strategy.

Firstgas Group recommends the ETS should offer flexibility through a balanced and cost-effective approach. We do not endorse a specific approach, but advocate for comprehensive, evidence-based analysis that evaluates all relevant aspects before drawing any conclusions. Business confidence should be highly prized within that balanced approach.

Contact details

Firstgas Group would welcome the opportunity to meet with Ministry staff to discuss the points we have raised in our submission. To arrange this meeting or if you have any questions, please contact me on [redacted] or via email at [redacted]

For more information about Firstgas Group's businesses, refer to **Attachment 1**.

Yours sincerely

Callum McLean
Senior Policy & Government Affairs Advisor

Attachment 1 About Firstgas Group

Our vision is to lead the delivery of New Zealand's energy in a changing world. Our mission is to safely and reliably deliver energy that's affordable and accessible to Kiwi families and businesses. We're proud of this and of the important role we play in Kiwis' lives.

Firstgas Group is an umbrella brand consisting of Rockgas, Firstgas, Firstlight Network, First Renewables, Flexgas and Gas Services NZ. Firstgas delivers natural gas to over 165,000 customers through a gas network of over 2,500 kilometres of high-pressure transmission pipeline and 4,800 kilometres of distribution pipeline in the North Island.

Rockgas is New Zealand's largest LPG retailer serving over 138,000 customers from 10 branches and a network of 25 franchises throughout the country. We deliver 45kg bottles to homes for gas cooking, heating and hot water needs, as well as providing LPG tanks for business gas essentials. BBQ 9kg bottles and LPG vehicles are also covered by Rockgas, with a network of more than 180 Refill & Save locations throughout New Zealand.

Firstlight Network is the electricity lines company for Tairāwhiti and Wairoa. Firstlight delivers electricity to more than 25,000 customers over a 12,000 square kilometre area.

Flexgas and Gas Services NZ are energy storage, operations and maintenance companies which make sure gas can be delivered safely and continuously. Flexgas operates the Ahuroa gas storage facility in central Taranaki. Gas Services NZ provides operational and maintenance support to all gas infrastructure owners, including the companies within Firstgas Group.[1]

New Zealand's homes have benefited from a choice of energy sources to meet their household needs. Currently there are over 400,000 homes in New Zealand which have natural gas and LPG. These homes predominantly use gas for cooking, instant hot water and heating. There are many benefits of having gas in the home. Natural gas is currently the most affordable way to heat water.[2] Gas boilers heat water so that it is instantly available. It requires no onsite storage in the home.

Firstgas is investigating opportunities for using our assets to help reduce New Zealand's carbon emissions. Our gas transmission and distribution networks cover much of the North Island and are ideally placed to support the development, transfer, and use of emerging fuels such as hydrogen and/or biogas.

Firstgas Firstlightnetwork rockgas
Flexgas First Renewables™ gas services nz

[1] For more information about Firstgas Group, visit www.firstgas.co.nz , www.firstlightnetwork.co.nz, www.rockgas.co.nz , www.flexgas.co.nz

[2] Home heating costs - Consumer NZ

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11 August 2023

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Redesigning the NZ ETS Permanent Forest Category Consultation,
Ministry for Primary Industries,
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Email: NaturalResourcesPol@mpi.govt.nz

Dear Sir/Madam

NZ ETS Review and Redesign of the NZ ETS Permanent Forest Category

Thank you for the opportunity to provide a joint submission on both the NZ ETS Review and the Redesign of the NZ ETS Permanent Forest Category. The West Coast Regional Council's (WCRC or the Council) submission is attached.

The Council consulted with their iwi partners, Te Rūnanga o Ngāti Waewae and Te Rūnanga o Makaawhio (Poutini Ngāi Tahu or PNT), who are mana whenua on the West Coast/Tai Poutini, in the development of this submission.

Our contact details for service are**:**

[redacted]
Planning Team Leader
West Coast Regional Council
PO Box 66
Greymouth 7840

Phone: [redacted]
Email: [redacted]

We would be grateful for acknowledgement of receipt of our submission.

Regards

Fiona Thomson
Planning and Science Manager

West Coast Regional Council Submission on:
1. NZ ETS Review
2. Redesigning the NZ ETS Permanent Forest Category

Introduction

The West Coast Regional Council (the WCRC or the Council) appreciates the opportunity to make a joint submission in two parts on:

1. The NZ Emissions Trading Scheme (ETS) Review; and
2. Redesigning the NZ ETS Permanent Forest Category.

Te Rūnanga o Ngāti Waewae and Te Rūnanga o Makaawhio (Poutini Ngāi Tahu – PNT) are mana whenua of Te Tai o Poutini (the West Coast). The WCRC's Mana Whakahono ā Rohe (Resource Management Act – Iwi Participation Arrangement) captures the intent of the WCRC and Poutini Ngāi Tahu to progress our relationship in accordance with the Treaty of Waitangi partnership between iwi and the Crown. Poutini Ngāi Tahu were invited to provide input into this submission.

NZ ETS Option Analysis

The WCRC is concerned that the four 'bundled' options outlined in the discussion document will potentially negatively affect the social, cultural, economic, and environmental well-being of the West Coast. The extent of this impact will depend largely on the underpinning policy and pricing instrument central government eventually settles on for emission reductions and removals.

Council considers that changes are required because the existing NZ ETS trajectory is not consistent with NZ's domestic path to its '2050 Target' under the Climate Change Response Act (CCRA). A considerable stockpile of NZUs exists, and NZ will need to reduce domestic emissions at source in line with its commitments rather than rely on offshore mitigation (paying for others to reduce their emissions because they are more efficient and more effective) and passing debt onto future generations.

Council suggests, amongst other options, a full review of the operation and effectiveness of the ETS is required and alternative scenario options developed that include a sustainability baseline to enhance, or at least uphold the social, cultural, economic and environmental well-being of iwi, local business, farms and communities on the West Coast.

Council is aware that, further to government intervention on 25 July 2023 in ETS price settings and following a tumbling carbon price and High Court judgment on an application for judicial review, ETS settings for the December 2023 auction will be changed. From December, the ETS will have a significantly higher floor price, lower auction volumes, and two tiers of much higher prices for the cost containment reserve (substantially increasing the trigger price to release additional cost containment reserve units). The Government also considered its annual decision on unit limits and price control settings for 2023 – 2028. Council notes that the SPOT NZU had rebounded to $59.75 on 1 August 2023 on a legitimate expectation of changed ETS settings, but Council has not had time to fully consider the effects of this intervention.

Redesigning the NZ ETS Permanent Forest Category

Council supports redesigning the NZ ETS Permanent Forest Category to include permanent indigenous forest species, but has concerns about the Government's rationale for including this. Council suggests some options to improve the effectiveness of having permanent indigenous forest in the ETS.

Due to our high workload, Council has only had time to consider the four high-level options presented by central government briefly, and does not support them due to the potential severity

of adverse effects on local West Coast communities. Similarly, brief feedback is given on a small number of the discussion document questions about the redesign of the permanent forest category in the ETS.

In the preparation of this submission, the Council consulted with Development West Coast, and Adolf Stroombergen, Economist at Infometrics. A number of their comments are incorporated into this submission.

Summary List of Feedback and Recommendations

Feedback 1
The Council does not support Options 1-4 as outlined in the discussion document.

Feedback 2
Council strongly opposes accounting for stockpiled units of removals as emissions reductions.

Feedback 3
The following options should be investigated to improve the effectiveness of the ETS so it enhances, or at least upholds, the social, cultural, economic and environmental wellbeing of the West Coast:

a) Temporarily maintain status quo;
b) Review operation and effectiveness of the ETS;
c) Progressive cap and trade ETS;
d) Undertake an effectiveness assessment of the ETS using a multi-agency decision-making process;
e) Diversify removals including biodiversity credits, restoring wetland carbon sinks through sphagnum moss farming, and engineered GHG removals such as carbon capture and storage, forest sinks;
f) Fund domestic offsets ('carbon sinks') as a matter of priority. Central government should fund private landowners on the West Coast now to maintain and restore wetlands, Significant Natural Areas (SNAs) and native forests on their land as carbon sinks; and fund development of new sinks such as blue carbon, in the form of seaweed and kelp farms on the West Coast.

Feedback 4
If changes are made to the ETS that have a perverse outcome on the social, cultural, economic or environmental wellbeing of the West Coast, the Government needs to find ways to provide for regional wellbeing.

Feedback 5
The Council does not support the current construction of the permanent forest category; or the Government's rationale for introducing permanent indigenous trees to the NZ ETS for commercial harvest, on the basis that NZ natives (unlike foreign exotics) sequester carbon over the long term, are low maintenance, can be planted and walked away from, and do not require pest control.

Feedback 6
The Government should adopt the following options to support ongoing, effective inclusion of permanent native forests in the ETS:

a) Incentivise planting of permanent native forests, including by allowing foresters to keep their credits at harvesting so they can pay for planting native forests;
b) Extend the time forest owners can receive credits to allow forests to gain credits based on averaging accounting of long-term carbon amounts;

c) Explore incentivising rotation forestry on small landholder farms, encouraging diversification of the forestry estate, delivering benefits to rural communities, and reducing the risks of forestry concentration in certain regions;
d) Put a progressive cap on the quantity of credits that can be in the ETS for permanent native forests, subject to conditions;
e) Allow a mix of exotic and native permanent forests, to manage risk and ensure a continuous removal of emissions over both the short term and long term; and
f) Consider establishing a separate scheme for permanent native forests, subject to a cap and trade system, using an auction allocation process.

Feedback 7

a) Transition forests should be managed through an effective management plan, and a new accounting method; and
b) Owners of transition forests should be compensated.

About the Submitter

The West Coast Regional Council (WCRC) is the local authority for a region covering a vast area with a sparse population. The distance from Kahurangi Point in the north to Awarua Point in the south is the approximate distance from Auckland to Wellington.

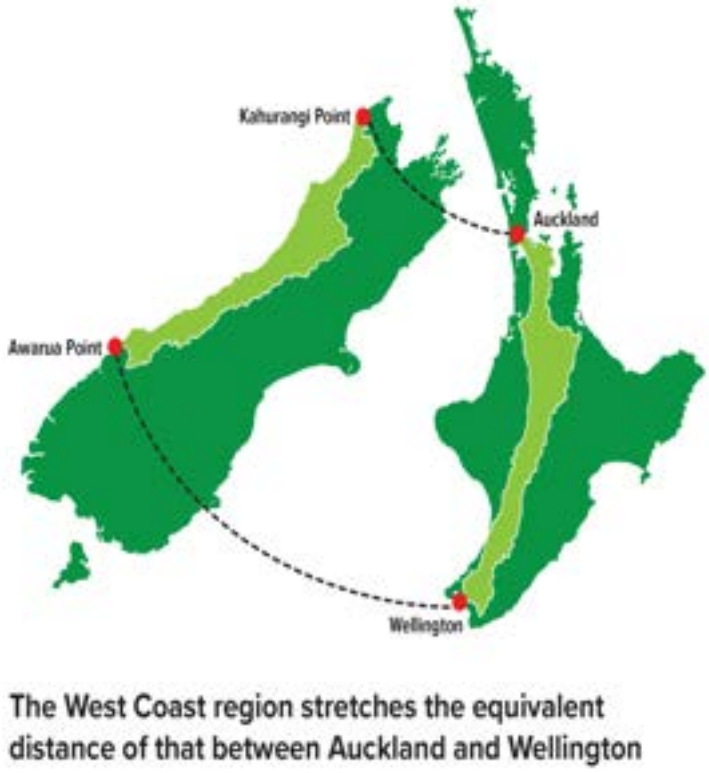

Figure 1: Map of New Zealand to highlight the 600km length of the West Coast Region compared to the distance between Auckland and Wellington.

The West Coast Regional Council works closely with the regions' three territorial authorities (the Buller, Grey, and Westland District Councils). The main towns are Westport, Greymouth,

Reefton, and Hokitika. The region's relatively low population of approximately 32,600 is spread across small towns, settlements, and rural communities.

Te Rūnanga o Ngāti Waewae and Te Rūnanga o Makaawhio (of Poutini Ngāi Tahu – PNT) are mana whenua of Te Tai o Poutini (the West Coast). The 'Paetae Kotahitanga ki Te Tai Poutini Partnership Protocol, Mana Whakahono ā Rohe Resource Management Act Iwi Participation Arrangement; A Protocol and Arrangement between Te Rūnanga o Ngāti Waewae, Te Rūnanga o Makaawhio, Te Rūnanga o Ngāi Tahu and the West Coast Regional Council of October 2020' captures the intent of WCRC and its partners to progress our relationship in accordance with the Treaty of Waitangi partnership between iwi and the Crown.

The West Coast is predominantly rural.

The Conservation Estate comprises 84.17% of the West Coast land area, with an additional 1.55% administered by Land Information New Zealand (LINZ). This leaves 14.28% of land available for private ownership. The land in the Conservation estate and Crown ownership is not rateable by local authorities.

As to the structure of the West Coast Region's Economy, and according to Infometrics 'Filled jobs by 54 industry categories list', the percentage contribution of various sectors to the regional economy, as at 2022, was:

- Health Care and Social Assistance - 11.1%;
- Accommodation and Food Services - 9%;
- Dairy Cattle Farming - 6.1% (and dairy product manufacturing 3%);
- Education and Training - 6.1%; and
- Construction Services - 4.4%.[1]

Infometrics 'Contribution to employment by broad sector, 2022' data shows the following sectors contribution to the West Coast Region's economy:

- 'Other services' accounted for 40%;
- 'High value services' 23.2%;
- 'Goods-producing industries' 22.1%; and
- 'Primary industries' made a 14.8% contribution.

I. Submission Points: NZ ETS Review

General comment

The ETS should be used as a contributory policy lever towards a defined "Net Zero" strategy, to support an economy-wide just and equitable transition in a cost-effective way, subject to a 'net zero benefit' factor. Consistent with the Climate Change Response Act (CCRA), the NZ ETS should assist NZ to meet its international obligations and its 2050 'net zero' target. In tandem to carbon pricing, policies need to be developed and implemented to support sectors to actively decarbonise.

Assessment of the 4 high-level options proposed and how these might affect the West Coast

[1] Structure of West Coast Region's Economy; Source Infometrics at https://ecoprofile.infometrics.co.nz/West%20Coast%20Region/Employment/Structure, last viewed 15 May 2023.

Option 1. "*Use existing NZ ETS levers to strengthen incentives for net emissions reductions".* Under this bundled option, *"the government would reduce the supply of NZUs [New Zealand Units, 1 metric tonne CO2e], and therefore reduce net emissions, through existing levers such as auction volumes, price controls or industrial allocation*". Government anticipates that reducing the number of NZUs supplied will increase the price of carbon in the short term. Depending on the degree of the price increase, emitters would be incentivised to reduce their emissions, exit the market or take their business elsewhere; and foresters would earn a good return on their investment.

However, Option 1 also proposes to increase the stockpile of units, and it is unclear how this will benefit West Coast farmers and mana whenua in the medium to long term. If foresters keep harvesting, and the harvested units allocated into the market trading mechanism reduce, then the stockpile will increase. NZ will still be dependent on using offshore mitigation (buying emission reductions and removals (sinks) that have occurred in other countries).

One option that has been proposed is to introduce agriculture into the ETS and give money (subsidies) to farmers to reduce production. The Council does not support this type of cap or option. Being a predominantly rural area, the WCRC asks how government will pay for offshore mitigation without passing exorbitant costs onto local farms and West Coast communities.[2]

The Government's intervention on 25 July has had the effect of implementing Option 1 in terms of reducing the number of emissions credits in the ETS and increasing the carbon price. However, the Council does not support this 'cap and trade' approach as it is not necessarily on a 'net zero' trajectory for achieving the '2050 Target'.

Increasing the carbon price and consequent increase in household costs to pay for offshore mitigation is likely to have a disproportionate impact on local communities and households on the West Coast, especially on Māori households, which are disproportionately represented in lower income groups. Option 1 is not supported.

Option 2. *"Create increased demand for removal activities to increase net emissions reductions".* Under Option 2, additional entities, for example, central government or offshore buyers, will be able to purchase NZUs outside the NZ ETS and thereby create distortionary market effects. Government purchases of NZUs to achieve NZ's NDC (Nationally Determined Contribution) and 2050 'net zero' target would also manifest as a type of subsidy; and not necessarily grow the West Coast economy.

Further, and also according to the discussion document, "*there is currently no evidence of significant demand from offshore buyers because the removals they would be purchasing would still count towards Aotearoa New Zealand's NDC."* Offshore investors buying up whole local farms could, however, be relying on tying NZUs, such as forestry credits, to a potential international ETS market, or a NZ ETS linked to the UK or EU's ETS's in the first instance.

Relying on creating market distortions, government subsidies, offshore buyers, and delaying NZ's competitiveness as a 'net zero' economy is not supported and will have significant adverse effects for the West Coast. Turning local farms into forests could impact on food security and employment. Delaying producing 'net zero' milk products, and supply chains, will potentially increase border charges, which will put an increased burden and cost on the local dairy industry, which is a significant industry on the West Coast. This has recently become evident as the local

[2] "The cost of purchasing offshore mitigation to achieve New Zealand's NDC1 [Nationally Determined Contribution 1 under the Paris Agreement] presents a significant fiscal risk. For all scenarios considered, our [central government's] analysis estimates this cost to be multiple billions over the period 2024 to 2030".

West Coast milk production company had to reduce its milk solids payout after Fonterra reduced their payout, removing $50 million from the West Coast economy. Option 2 is not supported.

Option 3. *"Strengthen incentives for gross emissions reductions by changing the incentives for removals".* Option 3 would create two carbon prices, one for emissions reduction activities and another for removal activities; and *"a lower price will apply to removal activities, making them less financially attractive"*. This form of market intervention would make forestry less viable for the small land holder or local West Coast farmer making sustainable plans in response to pricing of agricultural emissions. It would encourage forestry plantation at scale (low price/high volume) and, within the current market setting, whole of farm buyouts, and the conversion of farming and food security into forestry, by overseas investors could continue to increase.

This option would also impact detrimentally on the proposals the WCRC has regularly put forward to central government, which include: a) diversifying removal activities; and b) incentivising, and providing grant funding for, wetland, terrestrial SNA, sphagnum moss, and 'blue carbon' farming as removal activities at the local West Coast level. In addition, this option also omits to link to NZ's trajectory towards meeting its 'net zero' targets domestically. This is because reducing the price may not make removal activities "any less financially attractive": it is likely to make them 'more' financially attractive. Emitters may prefer to buy low priced NZUs rather than high priced NZUs.

Moreover, in Council's view, emitters are highly likely to prefer to buy low priced NZUs rather than reduce their emissions, which would defeat the purpose of this consultation. To contribute to NZ's reduction of Greenhouse Gas emissions, one of the Government's aims should be for the carbon price to remain strong for the long term. Option 3 is not supported.

Option 4. "*Create separate incentives for gross emissions reductions and emissions removals".* Option 4 is similar to Option 3 insofar as it would create two carbon prices, one for emission reduction activities and another for removal activities. There would be separate incentives for emission reductions and removals; emitters would not be able to allocate units for removals to meet their surrender obligations for their gross emissions; and the price paid for emission reduction activities and removals would not be linked to any common aim because they are in separate structural markets. By extension, there would be no link to a 'net zero' trajectory.

Option 4 differs from Option 3 insofar as it would create two completely separate markets, and central government would not intervene with a lower price for removals. The market would decide as to whether 'net zero' is met or not. Central government could, however, intervene to control unit supply settings. Creating two separate markets, relabelling removals as reductions, letting the market determine the price but also permitting the Government to intervene to control supply as that won't affect price, is inconsistent.

Government indicates this option would be more aligned with the EU and UK ETSs, but the EU and UK ETSs do not operate in exactly the same manner as the NZ ETS. Linking NZ's ETS to GHG emission trading schemes in strategic countries could potentially increase the cost-effectiveness of achieving NZ's emissions reductions target.

Moreover, it is very unclear as to how Government would divvy up NZ stockpiles, which don't distinguish between emissions reductions and removals. Applying rules of origin and recognisable standards of tracing would be expensive. Central government suggests accounting for stockpiled units of 'removals' as 'emissions reductions'. However, Council strongly opposes this proposal and does not support it in any way. Removals are not 'emission reductions' and should not be accounted for as 'emission reductions'; and doing so could severely dent NZ's integrity and credibility. Option 4 is not supported.

In sum, changes are required because the existing NZ ETS trajectory is not consistent with NZ's domestic path to Net Zero. A considerable stockpile of NZ Units exists, and this stockpile is accruing, which could dampen the price of NZUs and limit effectiveness of the NZ ETS. None of the four high-level options proposed address these issues adequately. Council agrees with central government insofar that the current demand-supply dynamic is 'highly unlikely to be sustainable', is likely to lead to a fall in price, and is an inadequate incentive for emitters to reduce emissions.

Feedback 1
The Council does not support Options 1-4 as outlined in the discussion document.

Feedback 2
Council strongly opposes accounting for stockpiled units of removals as emissions reductions.

How could the ETS or its operation be changed to improve its effectiveness?

This section of the submission suggests several options for reviewing the operation and effectiveness of the ETS to improve its effectiveness, and to enhance, or at least uphold the social, cultural, economic and environmental well-being of iwi, local business, farms and communities on the West Coast.

<u>Temporarily maintain status quo</u>
The status quo should be temporarily maintained until the Government conducts a thorough review of the operation and effectiveness of the ETS, and develops an alternative balanced scenario based on 'net zero' (local economy) benefit baseline.

<u>Review operation and effectiveness of the ETS</u>
An optimal ETS option should be explored and developed which, amongst other:

- links to achieving the 'fit for 50', net zero by 2050 target, subject to a baseline for sustainability; and incentivises optimal domestic decarbonisation subject to the baseline, and by region.
- removes distortions and anomalies in the existing ETS, which have an adverse effect;
- gives industry the certainty it needs to invest in research, development and new technologies for a 'net zero' economy;
- accounts for the emissions from aviation and shipping; and
- separate accounting, monitoring, evaluation, and reporting apply to emission reductions and removals by sector.

<u>Progressive cap and trade ETS</u>
Subject to being on a 'net zero' trajectory for achieving the '2050 Target', the Council supports a progressive 'cap and trade' ETS in principle, whereby a cap which reduces over time, is set on the total amount of GHG emissions that a regulated emitter can emit at source by sector. A 'cap and trade' ETS must be subject to conditions, including:

a) upholding local government's mandate of improving social, cultural, economic and environmental well-being;
b) exemptions for certain small emitters and microbusinesses which put in place other measures to cut their emissions by an equivalent amount; and
c) cost effectiveness.

<u>Undertake an effectiveness assessment using a multi-agency decision-making process</u>

Council recognises the challenges facing central government and suggests an alternative decision-making process consistent with the CCCRA.

In order to make objective decisions, central government, the Climate Change Commission and the Parliamentary Commissioner for the Environment should all work together to undertake a thorough assessment of the structure, operation and effectiveness of the NZ ETS, in comparison to the EU ETS and UK ETS. The review should include evaluating unit limits and price control settings.

Diversify removals and other options

There are a range of other options which should be utilised for improving the ETS and achieving the 'net zero' goal. Some of these will contribute to maintaining or improving the social, cultural, economic and environmental wellbeing of the West Coast:

- Opportunities should be considered for diversifying removals, e.g., biodiversity credits, restoring wetland carbon sinks through sphagnum moss farming, engineered GHG removals such as carbon capture and storage, geothermal sinks, forestry sinks, and incentives to decarbonise at source, e.g., industry and urban transport;
- As per the Council's submission on the second Emissions Reduction Plan:
  - Diversify and fund domestic offsets ('carbon sinks') as a matter of priority. Central government should fund private landowners on the West Coast now to maintain and restore wetlands, Significant Natural Areas (SNAs), and native forests on their land as carbon sinks;
  - Develop domestic offsets for new sinks such as blue carbon, in the form of seaweed and kelp farms on the West Coast;
  - Reform the ETS to support quality carbon credits and provide separate accounting for forestry removals;
  - Real emissions reductions also need to be subject to a baseline, which ensures 'energy security', 'food security', social/cultural/economic wellbeing and a just transition.

The ETS Review discussion document does not comment on the Government's current consultation on a biodiversity credit system (BCS). It is not clear how a BCS would operate in relation to the ETS.

Council understands that a just transition is difficult to quantify as there is no modelling done in New Zealand. If changes are made to the ETS that have a perverse economic outcome for the West Coast, the Government would need to find ways to provide for regional wellbeing. [3]

Feedback 3

The following options should be investigated to improve the effectiveness of the ETS so it enhances, or at least upholds, the social, cultural, economic and environmental wellbeing of the West Coast:

g) Temporarily maintain status quo;
h) Review operation and effectiveness of the ETS;
i) Progressive cap and trade ETS;
j) Undertake an effectiveness assessment of the ETS using a multi-agency decision-making process;
k) Diversify removals including biodiversity credits, restoring wetland carbon sinks through sphagnum moss farming, and engineered GHG removals such as carbon capture and storage, forest sinks;

[3] Personal communication with Adolf Stroombergen, Infometrics, 1 August 2023.

l) Fund domestic offsets ('carbon sinks') as a matter of priority. Central government should fund private landowners on the West Coast now to maintain and restore wetlands, Significant Natural Areas (SNAs) and native forests on their land as carbon sinks; and fund development of new sinks such as blue carbon, in the form of seaweed and kelp farms on the West Coast.

Feedback 4
If changes are made to the ETS that have a perverse outcome on the social, cultural, economic or environmental wellbeing of the West Coast, the Government needs to find ways to provide for regional wellbeing.

This ends our submission on the ETS Review discussion document.

II. Redesign of the NZ ETS Permanent Forest Category

Central government's design choice 1: *Which forests should be allowed into the permanent NZ ETS forest category - exotic, indigenous, transition, transition and indigenous, long-lived exotics, exotics on Māori -owned land, or small-scale exotic forests planted on farms?*

To answer this question, it is important to ask whether the NZ ETS permanent forest category introduced in January 2023 is properly structured in the first place.

The Council does not support the current construction of the permanent forest category that was introduced into the ETS earlier this year. The carbon credit is not considered a quality one if it does not meet tests such as 'objective permanence', additionality, and scientific validity. Deforestation does not reduce emissions. To quote the International Panel for Climate Change (IPCC), "*Among various LULUCF ['land use, land-use change and forestry'] activities, reducing deforestation has the largest potential to reduce anthropogenic GHG emissions, followed by carbon sequestration in agriculture and ecosystem restoration including afforestation and reforestation.*[4] *However, the main challenges of LULUCF activities are their potential reversibility and non-permanence of carbon stocks."*

In the context of the new NZ ETS permanent forest category, provision to harvest in 16 years' time does not, in Council's view, meet a test of 'objective permanence', and attaining NZ's 'net zero' commitments is over-reliant on mono-culture GMO pine forestry removals. There is no distinction between carbon farming for the long term and commercial forestry plantation, which 'deforests' on rotation.

In principle, the WCRC therefore supports redesigning the permanent forestry category. However, we do not support open-ended planting of more and more trees based on the premise that the carbon price is increasing. The carbon price of Spot NZUs plummeted on the secondary market falling from $88.50/mtCO2e at the 16 November 2022 close, to opening at a $35 bid on 7 July 2023. The March and June 2023 auctions failed to clear, that is, auctions were declined, the confidential reserve price was not met, and no auction revenue was generated. As a consequence, the price result was different from the prediction and yet policy settings were driven on the assumption of an increasing price and the opportunity to reap economies of scale from biomass. A tumbling price blocked the behaviour required to reduce gross emissions.

Council also opposes Government's rationale for introducing permanent indigenous trees to the NZ ETS for commercial harvest, on the basis that NZ natives (unlike foreign exotics) sequester carbon over the long term, are low maintenance, can be planted and walked away from, and do not require pest control. NZ's indigenous trees are not the only trees that sequester carbon over the long term; and they are not the only trees that are resilient to pests. Redwoods, and certain exotics from the Congo and the Amazon, sequester carbon for thousands of years. Both NZ native and exotic forests require pest control that meets recognisable border measures and strategic management plans between forestry and farmers.

The Council raised concerns in its previous two submissions on reviewing the ETS, and permanent carbon forestry, about government's suggestion to advance extensive uncontrolled commercial afforestation at scale to produce biomass at scale to take advantage of a rising carbon price. These types of forest activities may have adverse socio-economic impacts for the West Coast, e.g., the cost of transporting biomass into the West Coast, storing it and keeping it dry could be high and could harm our suggestions for advancing the small holder 'net zero circular farming community' on the West Coast. Planting forests at scale and walking away from them

4 See Figure SPM.7 in the IPCC WGIII report.

depopulates rural areas, local school rolls drop, there is less use of the community hall, welfare issues arise when people cannot get jobs elsewhere, and pest numbers can increase if not controlled.

Feedback 5
The Council does not support the current construction of the permanent forest category; or the Government's rationale for introducing permanent indigenous trees to the NZ ETS for commercial harvest, on the basis that NZ natives (unlike foreign exotics) sequester carbon over the long term, are low maintenance, can be planted and walked away from, and do not require pest control.

Options for addressing permanent forestry issues in the ETS

The Council supports having permanent native forests in the ETS subject to conditions, as carbon sinks over the long term. The following are options to support ongoing, effective inclusion of permanent native forests in the ETS.

Incentivise planting of permanent native forests
In the long term, forestry needs to move towards long-lived native forests. The Government will need to give people an incentive or income to be able to plant native forests. Council understands that currently credits can be gained for permanent forests in the ETS, however the easy choice is to plant pines as they grow quicker, but lots of pine forests are not a good option in the long term. The current settings do not encourage planting of native forests, so this should be changed in the ETS. Harvesters could be allowed to keep their credits at harvesting so they can pay for planting native forests. The ETS needs to send a signal to incentivise native forestry.

Extend the time forest owners can receive credits
While the ETS is under review, one option is to extend the time forest owners can receive credits. This should be included in the ETS. This could be done for both the permanent post 1989 forest category and for forestry under the 'averaging accounting' method as introduced in January 2023, which allows forests to earn NZUs based on the government's calculated average of the long-term amount of carbon that government expects a particular forest to store over multiple rotations.

Exploration of this simple policy change should also explore incentivizing rotation forestry on small landholder farms, encouraging diversification of the forestry estate, delivering benefits to rural communities and reducing the risks of forestry concentration in certain regions. The benefits of forestry, including jobs, income and productivity should be realised more equitably across the country. Additionally, allowing forests to absorb more carbon over a longer period of time, and putting a quota on land use for forestry, could halve the volume of land required for forestry to deliver the same carbon outcome. Furthermore, such forests, if properly maintained using pest control mechanisms that are compliant with cross border trade, may also assist to absorb agricultural emissions.

Progressive cap on quantity of credits for permanent native forests
A progressive cap should be put on afforestation of permanent native forests that can be allowed into the ETS, subject to conditions which include:

- Rules around rotation cycles and who can earn NZUs;
- Providing for te mana o te Taiao, and te oranga o te Taiao;
- Making an effective contribution to NZ's international and domestic emission commitments as legislated for in the CCRA;
- Meeting the 'permanence' test by having no intention of being deforested;
- Meeting the 'additionality' test which includes co-benefits of pest control, and biodiversity protection and enhancement; and
- Meeting the test of 'scientific validity' and certification requirements to trade.

Allow a mix of exotic and native permanent forests
Council also supports a mix of exotic and native forests, to manage risk and ensure a continuous removal of emissions over both the short term and long term.

Explore a separate scheme for permanent native forests
It may be that forestry needs to be treated differently in the ETS, or a separate scheme is established for it. The quantity of credits must be limited in a cap and trade system, and an auction system can support this process.

Feedback 6
The Government should adopt the following options to support ongoing, effective inclusion of permanent native forests in the ETS:

g) Incentivise planting of permanent native forests, including by allowing foresters to keep their credits at harvesting so they can pay for planting native forests;
h) Extend the time forest owners can receive credits to allow forests to gain credits based on averaging accounting of long-term carbon amounts;
i) Explore incentivising rotation forestry on small landholder farms, encouraging diversification of the forestry estate, delivering benefits to rural communities, and reducing the risks of forestry concentration in certain regions;
j) Put a progressive cap on the quantity of credits that can be in the ETS for permanent native forests, subject to conditions;
k) Allow a mix of exotic and native permanent forests, to manage risk and ensure a continuous removal of emissions over both the short term and long term; and
l) Consider establishing a separate scheme for permanent native forests, subject to a cap and trade system, using an auction allocation process.

Central government's design choice 2: How should transition forests be managed to ensure they transition from exotic to indigenous forests and reduce the financial risks to participants - through an existing or new accounting method?

Council considers that transition forests, which are exotic forests that transition to native forests over time to increase sequestered carbon, would need to be managed through an effective management plan, and a new accounting method.

The main issue with transitioning forests is that those with current forests should be compensated. This could affect Ngāi Tahu as the main commercial forestry operator on the West Coast. If certain foresters replant now, they may be able to get credits under the old ETS system or they may need to surrender NZUs to the government. But from 1 January 2023 all forests newly registered in the NZ ETS will be required to utilise either averaging accounting or enter into the new permanent post-1989 forest category.

Feedback 7

c) Transition forests should be managed through an effective management plan, and a new accounting method; and
d) Owners of transition forests should be compensated.

This ends our submission on the redesign of the permanent forest category in the ETS.

Forest & Bird

TE REO O TE TAIAO | *Giving Nature a Voice*

Submission on Te Arotake Mahere Hokohoko Tukunga Review of the New Zealand Emissions Trading Scheme

To	**Ministry for the Environment**
Attn	ETS Review team
From	**Royal Forest & Bird Protection Society of New Zealand Inc. (Forest & Bird)**

Submitter	The Royal Forest & Bird Protection Society (Forest & Bird) PO Box 631 Wellington 6011 Attn: [redacted]

Date	**16 August 2023**

Introduction to Forest & Bird

New Zealand's largest and oldest conservation organisation
The Royal Forest & Bird Protection Society (Forest & Bird) is New Zealand's largest and longest-serving independent conservation organization with over 100,000 members, supporters, and volunteers. Our mission is to be a voice for nature – on land, in the sea, and in our fresh waters.

Forest & Bird's constitutional purpose is to *"take all reasonable steps within the power of the Society for the preservation and protection of the indigenous flora and fauna and the natural features of New Zealand."*

Independent and funded primarily by members and supporters
We are a registered charity, with our funding coming primarily from members and supporters; we receive government grants only for specific practical projects. Forty-seven volunteer branches throughout New Zealand work on the ground to restore nature through activities such as running pest control programmes, native plant nurseries, field trips, and public talks.

An advocate for nature
Forest & Bird advocates for policy development and law reform, and represents nature in the Environment Court, at Environmental Protection Authority boards of inquiry, and in council planning processes. A century after establishment, we are still working just as hard for the protection and restoration of our wildlife and wild places on land, in freshwater, and at sea.

Te Arotake Mahere Hokohoko Tukunga: Review of the New Zealand Emissions Trading Scheme

1. **The clear need to restructure the ETS**
   The Emissions Trading Scheme (ETS) is meant to be New Zealand's core climate change tool to drive greenhouse gas emission reductions but it is clear that it has failed to do so. In large part, this reflected thinking that climate change policy should deliver least-cost emission reductions without considering the need for structural changes to infrastructure and the economy that drive lower-cost future emission reductions.

2. As a result, New Zealand has prioritised exotic tree planting and postponed emission reductions to such an extent that we are reaching social and environmental limits of exotic forestry. At the same time, we are finding emission reductions are more expensive due to delayed action and will likely need to offset our lack of domestic emission reductions with the purchase of a substantial amount of credits from offshore. There is a clear need to restructure the ETS to incentivise emissions reductions, and enable and accelerate removal activities, particularly indigenous afforestation, for medium to long-term sequestration (30-100 years and beyond).

3. The current problem with the ETS is that it drives 'net' emissions reductions without sufficiently impacting 'gross' emissions. Without changes, the ETS market is expected to fail, with a price crash caused by an oversupply of exotic pine units.

4. The ETS currently incentivises short-term fast-growing plantation pine forests, whereas we also need longer-living indigenous forests. In *Inaia Tonu Nei* (2021),[1] the Climate Change Commission recognised that Aotearoa will need to start now to grow new native forests so that carbon removals can be used to offset the remaining long-lived greenhouse gas emissions from 2050 onwards (p.66). It has recommended an approach that would see long-term carbon storage occurring in natural ecosystems with plantation forestry playing a role, not in carbon storage but as a feedstock for a circular economy.

5. **Pushback to restructuring the ETS**
   Pushback to restructuring the ETS appears to come from three sources. First is the government. Because the ETS is not independent of government, it is vulnerable to short-term political decisions that undermine the long-term goals of the ETS, such as we've seen recently with the Lawyers for Climate Action successful judicial review decision of cabinets decision to not follow the Climate Change Commissions advice around the number of additional ETS units available over the next five years. The appeal of the status quo to the Government is that it does not impose significant additional costs on businesses or households, while we are in a cost-of-living crisis – short term thinking.

6. Second is pushback from the forestry sector. The forestry sector has become reliant upon carbon income and are resistant to change as they fear a reduction of income. This opinion piece from Andrew Cushman head of the Forest Owners Association is representative:

   > *What we have is a Government and a Minister running amok to destroy an industry and ruin its ability to contribute to netting off the worst of our climate impacts…*.and…*This reform process is madness. We need to throw everything we have at meeting the challenge of climate change – we don't have time to wait for ideologically pure outcomes, or redesigns, or dodgy policy options based on equally dodgy or secret data.*[2]

7. Third is pushback from some Māori exotic forestry interests. Māori own 30% of Aotearoa's exotic forest estate and are justifiably concerned that their ability to make money from land that was often returned to them in Te Tiriti settlements may be reduced.[3] Forest & Bird believe that the

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[1] Climate Change Commission. (2021). *Ināia tonu nei: a low emissions future for Aotearoa Advice to the New Zealand Government on its first three emissions budgets and direction for its emissions reduction plan 2022 – 2025*. Retrieved from: https://www.climatecommission.govt.nz/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf

[2] Cushen, A. (2023, 25 Jul). The ETS works just fine, but unaffordable, ideological reforms will set us back. *Carbon News*. Retrieved from: https://www.carbonnews.co.nz/story.asp?storyID=28273&src=newsletter

[3] Dewes, T.K. (2023, 21 Jul). Māori foresters angry at 'destruction of value' in emissions trading scheme. *Newsroom*. Retrieved from: https://www.newsroom.co.nz/maori-futures-a-political-football-in-emissions-trading-scheme-debate

Government has a responsibility not to disadvantage Māori but cautions against strategies that undermine the ETS in achieving this.

8. **Concern around the framing of this consultation**
The consultation options do not appear to be driven by any clear outcome across the different options. In an article commenting on this consultation, Sebastian Gehricke, director of the Climate and Energy Finance Group at the University of Otago argues, "The consultation document itself explains how the first two options will not achieve the goals, so why are they even proposed?" And "To truly let the ETS be the main tool to encourage emission abatement by NZ entities, by increasing the cost of emitting activities, there will have to be some pain and change, it seems these proposals are trying to avoid that harsh reality." [4]

9. Given the lack of clear outcomes that this consultation offers, our submission is structured around key principles we believe are important, if indeed the goal is to:
    - Decouple gross emissions reductions from removals to drive more removals.
    - Continue to incentivise short term exotic forestry removals.
    - Incentivise indigenous afforestation for longer term removals.

10. **Key principles**
Reformation of the emissions trading scheme should reflect the following principles in order to deliver a fair and effective scheme that contributes to New Zealand's emission reduction goals, assists New Zealand to make a fair contribution to global efforts to tackle climate change and is also good for nature.

11. **New Zealand should do its fair share of global effort to cut greenhouse gas emissions**
Climate Action Tracker does an objective review of the climate change performance of countries relative to the global action required and as a fair share of global efforts. New Zealand is currently tracking between 'insufficient' and 'highly insufficient' on the current NDC and ERP pathway (https://climateactiontracker.org/countries/new-zealand/).

12. The context for New Zealand to do its fair share has changed with New Zealand signing a trade deal with the EU that requires New Zealand to act on climate change, severe weather events becoming more prevalent and prominent across the globe and in New Zealand, and our largest trading partner China on track to peak its emissions in 2025, five years earlier than planned. New Zealand's current targets are based on doing the global average effort despite New Zealand being wealthier than average, having higher emissions than average, and having a greater responsibility for historical emissions than average. We now need to play catch-up.

13. **Emissions should be cut with urgency**
The AR6 Synthesis Report (2023) written by the world's climate science experts, states that "Global warming will continue to increase in the near term in nearly all considered scenarios and modelled

[4] Carbon News. (2023, 20 Jun). *ETS review options will take too long to implement: expert*. Retrieved from: https://www.carbonnews.co.nz/story.asp?storyID=27995

pathways. Deep, rapid, and sustained greenhouse gas emissions reductions…are necessary to limit warming to 1.5 degrees, or less than 2 degrees by the end of the century" (p.33). [5]

14. **Emissions pricing should drive gross emission reductions**
The ETS was designed as a tool to enable New Zealand to meet international targets and obligations at short-term least-cost. This has largely been achieved by offsetting industrial and transport emissions through planting exotic forests, exempting agriculture, and transferring the burden of emissions costs from the agriculture sector and large polluting trade-exposed industries from polluters to the taxpayer. This has resulted in a failure to achieve structural reform of the New Zealand economy which in turn has resulted in an increase in the relative cost of future emission reductions. New Zealand has taken an approach of prioritising short-term least-cost sequestration over strategic long-term actions that would reduce the future cost of emission reductions. We have now reached the end of the line of this approach as exotic forestry exceeds social and environmental limits.

15. **Emissions pricing should support long term nature-based carbon storage**
ETS settings to date have incentivised short-term exotic forestry to quickly remove carbon but there is an increasing need to incentivise longer-term sequestration which indigenous forests are better suited.

16. A re-set is needed that includes the pest control management of pre-1990s native forests to ensure they don't become net carbon emitters and we understand that the proposed biodiversity credit system will support this. Forest & Bird would like to see the inclusion of other indigenous vegetation into the ETS such as tussock lands, wetlands, peatlands and shrublands, while upholding the integrity of the international system. In addition, redesign of the permanent forests category needs to ensure high integrity of the category. Permanent must mean – as far as possible – permanent. That means closing loopholes that increase reliance on exotic species, to planting native forests as permanent forest carbon sinks.

17. **All sources and gases should be covered**
This current consultation is explicitly not considering agricultural emissions, while the Government tip toes around *He Waka Eke Noa*, even though the Emissions Reductions Plan is scheduled to include agriculture from 2025. The agricultural sector has successfully delayed taking responsibility for its emissions for twenty years, a tactic that Rod Donald explains as agriculture finding it less expensive to delay than reduce emissions, which he terms "predatory delay". [6] Action to reduce agricultural emissions has co benefits for animal welfare, land management and water quality and these co benefits should be factored into decisions on the ETS. The fiscal cost to the Crown from the exclusion of agriculture needs to be considered in the review of the ETS. Irrespective of

[5] IPCC. (2023). *Climate Change 2023: Synthesis Report. A Report of the Intergovernmental Panel on Climate Change. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Retrieved from: https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_LongerReport.pdf
[6] Donald. R. (2023, 11 May). Predatory delay on climate action by Fonterra, Dairy NZ and Federated Farmers. *Greenpeace*. Retrieved from: https://www.greenpeace.org/aotearoa/story/predatory-delay-climate-action-fonterra-dairynz-federated-farmers/

whether the ETS includes agriculture, agricultural emissions need to be considered and paid for when reconciling New Zealand's NDC.

18. **Climate change policy should reflect just transitions principles**
The impact of the ETS on households is relatively low but it is regressive with lower-income households paying more than twice as much of their income on emissions prices as high-income households (Consultation document page 40). There is a clear need for more equitable cost mitigation options, so that the costs of energy transition are not unfairly borne by those who can least afford it.

19. It is better to use tax and incomes policy to address any inequitable burden as a result of the ETS, and its regressive nature, rather than reduce the effectiveness of the ETS to compensate, as has been done to date. Consideration needs to be given to an appropriate transition for communities that may face significant change by assisting those communities to develop low emissions and sustainable development pathways.

20. Delaying reducing emissions is also not consistent with just transition principles. The Government's reluctance to increase costs to consumers during a high inflation period has led to the destabilisation of the ETS and a successful Judicial Review, by Lawyers from Climate Action, over the number of units made available for auction. Lawyers for Climate Action spokesperson Bronwyn Carruthers KC, stated: "It is vital that the ETS settings are made in accordance with our emissions budgets and not out of political concerns about the ETS price going too high." [7]

21. **Climate change policy should respect the Treaty of Waitangi**
To achieve an equitable transition for Māori, the Government needs to: consider Māori interests, reduce existing barriers for Māori participation, and avoid creating new inequities in its climate response. This is challenging as Māori own 30% of NZ's exotic forestry and are dependent upon ETS income (Chapter 4 of consultation), as well as having a significant stake in other primary production.

22. A key consideration is that colonisation has often left iwi and hapū with the least productive land and presently pine plantations are the most economic use of much of the land. A large percentage of whenua Māori is also cloaked with native rainforests – both regenerating (across Te Taitokerau) and ancient (e.g., Te Urewera, Raukūmara). Comprehensive pest control tackling introduced browsing animals opens a new pathway to earn income (perhaps via biodiversity credits) to ensure long-term carbon storage.

23. A whole new Māori environmental economy could grow from carbon credits alone, and possibly biodiversity credits too, which will enable another option for Māori economic survival in their homelands and active kaitaiakitanga.

[7] Lawyers for Climate Action (2023, 13 July). *LCANZI wins judicial review over slack ETS*. Retrieved from: https://www.lawyersforclimateaction.nz/news-events/ets-jr-win

24. **Permanent must be permanent**

C02 persists in the atmosphere for a very long time. This infographic from the international climate science organisation Climate Analytics shows that approximately 40% remains after 100 years, 20-25% remains after 100 years and some persists in the atmosphere after 10,000 years. [8]

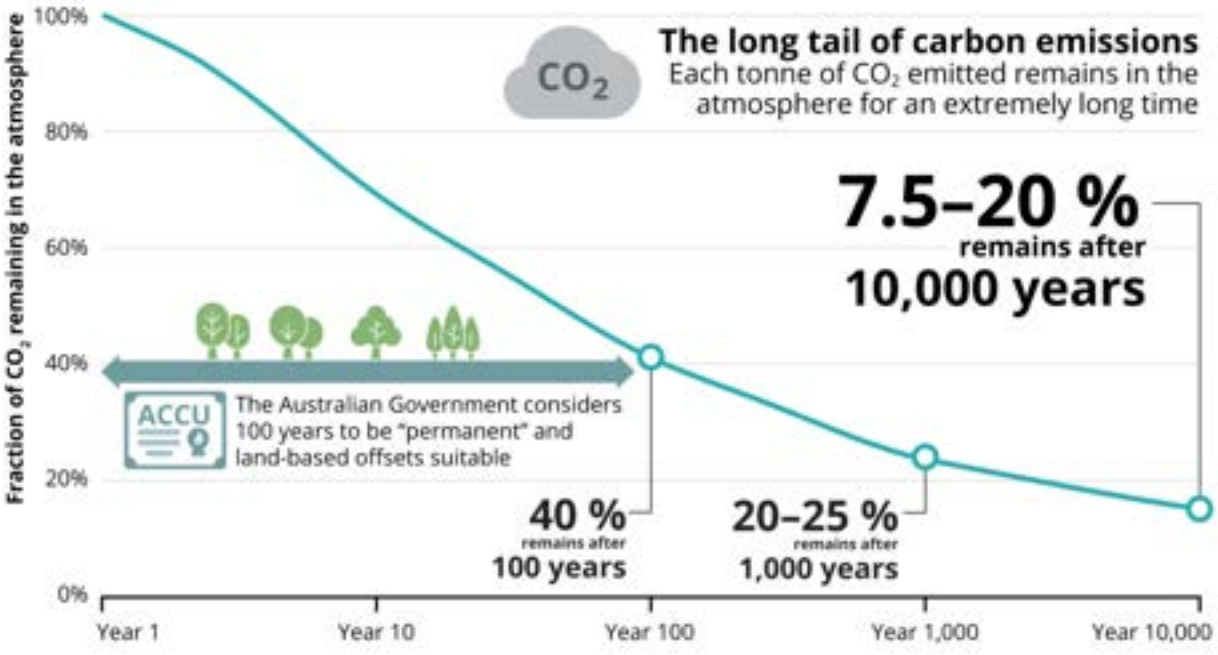

Figure 1: The long tail of carbon emissions.[9]

25. To equate the release of 1 unit of CO2 into the atmosphere with 1 unit of CO2 sequestered in exotic pine trees is not equivalent. Roughly half of Aotearoa's pine logs are exported to China and processed into consumer goods with short lifespans. Life cycle analysis of the global forest industry, from planting to manufactured products, shows that rather than a net sequestration activity, it is instead a net emitter: "Net sequestration of CO2 from the atmosphere into the forest products industry value chain...[is] enough to offset...almost one-half of the total emissions of the value chain".[10] This life cycle analysis has not been done for the New Zealand Forest Industry.

26. There is increasing international scrutiny of offsetting claims. The global Climate Action Network is a collective of more than 1800 environmental NGOs, including Forest & Bird. The Climate Action Network has recently taken a stance opposing offsetting.[11] Therefore permanent carbon sinks, must be just that: permanent.

27. A key opportunity to sequester carbon long term comes from New Zealand's pre-1990s moist temperate native rainforests as Professor Tim Flannery has pointed out in an interview for the O

[8] Climate Analytics (2023, Feb). *Why offsets are not a viable alternative to cutting emissions*. (p.4). Retrieved from: https://climateanalytics.org/media/why_offsets_are_not_a_viable_alternative_to_cutting_emissions.pdf
[9] Climate Analytics (2023, Feb). *Why offsets are not a viable alternative to cutting emissions*. (p.4). Retrieved from: https://climateanalytics.org/media/why_offsets_are_not_a_viable_alternative_to_cutting_emissions.pdf
[10] FAO (2010). Impact of the global forest industry on atmospheric greenhouse gases. *FAO Forestry Paper 159*. (p.44). Retrieved from: https://www.fao.org/3/i1580e/i1580e00.pdf
[11] https://climatenetwork.org/resource/position-on-carbon-offsetting/

Tātou Ngahere kaupapa.[12] But many of our native rainforests are currently in very poor health with introduced pest browsing animals including possums, feral deer, goats, wallabies, chamois and pigs significantly reducing the amount of carbon being sequestered and worse still, enabling carbon to bleed from forests as they collapse.

Figure 2: Pest impacts upon forests (Forest & Bird)

[12] Pure Advantage (2022). O Tātou Ngahere, Tim Flannery iInterview with Vincent Heeringa. Retrieved from: https://www.youtube.com/watch?v=KP0_iR7F3sc [4:30}.

28. Comprehensive pest control would return these habitats to significant carbon sinks on land with many other co-benefits for biodiversity and erosion prevention. Currently there is no definitive way to measure how much carbon is locked in pre-1990s native forests per hectare for annual comparison to renumerate carbon credits. Research is underway to find tools to do this. But because of the urgency of the situation, we need to get many types of landowners engaged and lodged to earn carbon credits for the pest control needed to increase carbon sequestration.

29. While the carbon sequestration research is underway, Forest & Bird urges that priority is given to pre-1990s native forests where control of all browsers is currently underway with carbon credits funded initially on a conservative average for North Island and South Island (including Rakiura). This can become more refined as the tools become more accurate, possibly to a regional or district average, then per hectare.

30. **If you want to cut down a tree, plant it**
Forest & Bird is concerned that indigenous trees planted for carbon income and future harvest may mixed up with conservation forests and existing indigenous forest on private land that has a conservation value (SNAs). Forest & Bird would like to see clear rules around which indigenous trees may be harvested in the future and recommend that a simple rule to ensure that conservation forests are protected is only indigenous trees planted for harvest can be felled. In addition, planted native tree species need to be demarcated and mapped with robust trace and track for any felling and milled native timber. There is currently an investigation into the poaching and milling of native trees under legal protection in Pureora Forest.[13]

31. **Forest & Bird position**
Forest & Birds supports the Climate Change Commission's proposal that the Government a) amend the ETS to split the incentives for gross emissions reductions from those applying to forestry, and b) develop an approach that can provide durable incentives for net carbon dioxide removals by forests through to and beyond 2050 (p.13).[14]

32. **Forest & Bird supports Option 4**, with the following additional measures.
    a. Decouple emissions from removals in the ETS to:
        I. Allow the Government to charge a price for emissions that will drive gross emissions reductions.
        II. Allow the Government to incentivise native afforestation.
    b. Steadily phase out industrial allocations over the next five years.
    c. Introduce vintaging of stockpiled units, so that they are only valid for 2 years.
    d. Government to spend money in New Zealand on emissions reductions and removals, rather than purchasing offshore credits to meet our Nationally Determined Contributions (NDC). For example, the estimated shortfall for the 10 years from 2021-2030 that we are planning

[13] Church, C. (2023, Jun 22). Exclusive: Criminals felling ancient native trees, selling for profit. 1 News. Retrieved from: Exclusive: Criminals felling ancient native trees, selling for profit (1news.co.nz)
[14] Climate Change Commission. (2023, April). *2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan*. Retrieved from: https://www.climatecommission.govt.nz/public/Advice-to-govt-docs/ERP2/draft-erp2/CCC4940_Draft-ERP-Advice-2023-P02-V02-web.pdf

to purchase offshore credits to meet is a cost of between $3.3 and $23.7 billion. $23 billion is more than 3 times the annual budget of The Department of Conservation over the same 10 year period.

e. Reduce political influence over the ETS by administering it via an autonomous entity with a core objective of lowering our emissions in line with our Emission Reduction Plans.
f. A just transitions programme to address any social inequalities or other externalities that are associated with the ETS.
g. ETS income should only be used for climate mitigation, not adaptation.

33. **ETS Pricing of different forest types**

Forest & Bird believe the ETS needs to set different prices for different types of forest. Indigenous afforestation requires incentivisation, as the return on investment is over a longer term than exotic forestry. Funding or zero interest loans could be made available to incentivise indigenous afforestation.

ETS Consultation Questions
ETS Review Primary Options
Option 1 Decrease the amount of emissions units so that the carbon price rises MFE: In the short-term this would incentivise polluters to reduce emissions faster and landowners to plant more trees. In the long-term with more removals from activities like forestry the price of carbon would be likely to drop.
Option 1 has potential short-term benefits but creates medium and long term problems that outweigh these benefits. Forest & Bird would prefer that the ETS has more demand through greater stringency than addressing the price incentive through supply-side policy alone. For this reason, Forest & Bird does not support this option.
Option 2: Increase the demand for emissions units by allowing the Government and/or overseas buyers to purchase them MFE: This may raise the price of carbon, incentivising emissions reductions and removals. But this option includes a lot of uncertainty, and demand from overseas carbon markets is likely to be limited.
Forest & Bird considers the likelihood of offshore buyers for NZ exotic forestry units is low due to a lack of confidence in their permanence because exotic plantation forestry removals are not viewed as high integrity emission reductions overseas. This approach is not supported by the Climate Change Commission, who state: "The Commission does not consider this option a viable way to encourage further gross emissions reductions or support a sustainable rate of afforestation" (Consultation document, p.59). For these reasons Forest & Bird does not support this option.

MfE staff also expressed concern that there will not be offshore buyer demand, which would make keeping unit price high very expensive for government (ETS consultation webinar)
Option 3 Restrictions or conditions are placed on removal activities MFE: This means emitters will need to purchase more emissions units from the Government or draw from stockpiled emissions units. This may encourage emitters to reduce their emissions, but it may not encourage new forests to be planted.
This approach, if combined with a regime to reward permanent carbon storage in natural ecosystems would be a potentially useful way to drive down emissions. Creating a separate market for permanent storage as per Option 4 would be preferable.
Option 4: Emitters will not be able to purchase NZUs from foresters to pay for their greenhouse gas emissions Emitters would purchase more New Zealand Units (NZUs) from the Government instead. The Government could purchase the removals from forestry to ensure new forests continue to be planted.
Forest & Bird supports this approach as it is the best long term solution, is compatible with the European and UK carbon markets, and addresses the issue of 'apples vs pears' with industrial emissions and biological removals.
Other ETS review considerations
Whether the ETS should improve incentives for native forests
Yes. Permanent must mean permanent.
Examine additional types of carbon removals such as from wetlands or direct air carbon capture
Develop carbon removal measuring for native wetlands, tussock lands, shrublands (e.g., matagouri) to extend what is eligible for permanent carbon sinks in the ETS, or biodiversity credits system (This is air carbon capture and is most efficient when combined with pest control). This will incentivise the protection of Significant Natural Areas, recognised in Regional Plans.
While a higher carbon price leads to faster emissions reductions, it is likely to have a knock-on effect of higher prices for goods and petrol
An appropriate just transitions approach to this problem is to use the tax, industrial relations, and incomes policies of government to correct social equity issues with emissions pricing. The Government should prioritise transport infrastructure spend on mode shift and electrification so that consumers become less reliant on fossil fuels. Because of the cost of new vehicles and the inflexibility of people's critical transport needs facilitating affordable mode shift will be key to

addressing equity and affordability issues.

The Government recognises the potential impacts of higher carbon prices, particular on lower-income families. Strategies for supporting a fair transition are included in the Government's emissions reduction plan

An appropriate just transitions approach to this problem is to use the tax, industrial relations, and incomes policies of government to correct social equity issues with emissions pricing.

The Government should prioritise transport infrastructure spend on mode shift and electrification so that consumers become less reliant on fossil fuels. Because of the cost of new vehicles and the inflexibility of people's critical transport needs facilitating affordable mode shift will be key to addressing equity and affordability issues.

The Government also needs to consider how to ensure the transport needs of disabled people and their households can be met.

The Government has heard that more urgent climate action is required.

This should be reflected in increased ambition by the Government and urgent action.

Māori communities are disproportionately vulnerable and already facing the impacts of climate change

Some papakainga and urupa are situated in floodplains or vulnerable to storm surges and coastal inundation. There needs to be a prioritised targeted fund for the most urgent and vulnerable situations for adaption and movement to safer ground.

Consultation Questions

Chapter 2

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

Yes, we agree with the assessment of reductions and removals that the ETS is expected to drive with the current ETS settings.

2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

-

2.3 Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?

Farmers and other landowners are keen to carry out pest control, plant native species and fence off areas of native rainforests, wetlands, and tussock-lands, if these vegetation types were adopted into

the ETS permanent category. For years Forest & Bird has been asked across the country why pre-1990s native rainforests and wetlands are not already included as permanent sinks in the ETS.

2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

Yes. In addition to the many challenges of exotic afforestation explained in the table on pp.29-30, we would like to see the following point added: Exotic forests are inferior to indigenous forests in erosion reduction, improving soil conservation, biodiversity habitat and long-term sequestration.

Page 30 of the consultation says the Government has a 'right tree, right place, right purpose' strategy for forestry designed to address these challenges but we cannot find this strategy published anywhere. SCION, a Crown Research Institute has such a strategy, but this is not the same as the Government having such a strategy.

Chapter 3

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

Yes, driving gross emissions reductions is of critical importance. As a country we are committed to net zero by 2050 but we also must remain at net zero every year thereafter. Thus, we cannot get to 2050 simply by planting more and more forests for removals because we will run out of land.
We need a strong emissions price, decoupled from the removals price, to drive emissions reductions.

Aside from our international commitments there are numerous co-benefits from reducing gross emissions for biodiversity and human health and wellbeing.

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

Yes, marginal abatement costs mean that the emissions price should rise over time to achieve ongoing reductions of emissions.

Agree that a higher ETS price will increase cost of energy and effect household costs (pp.38-39)
Support increasing the NZ ETS price to drive greater gross emissions – but need some co-policies to ensure equitability (p.41).

Forest & Bird advocate for the Government to spend now on actions that will enable New Zealand to meet more of its NDC domestically, rather than buying offshore credits. Such actions will likely have environmental, social, and economic benefits.

3.3 How important do you think it is that we maintain incentives for removals? Why?

We need incentives for indigenous afforestation to meet our medium and long-term removals goals.
Chapter 4
4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?
-
4.2 What other interests do you think are important? What has been missed?
-
4.3 How should these interests be balanced against one another or prioritised, or both?
Forest & Bird don't want to see Māori unfairly disadvantaged through changes to the ETS and believe the best way to ensure this is for the Government to fund Māori to transition out of pine forestry into indigenous afforestation. This could be permanent forests or indigenous species for harvest.
4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?
Ensuring the permanent forests category is based around indigenous habitats will enable more people to return to their homelands to look after the whenua, with an income flow from carbon credits. There could be biodiversity credits added to this (if NZ can come up with a robust, affordable system that avoids offsets and greenwash) and other production incomes derived from the forests, e.g., medicines, honey etc.
Chapter 5
5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?
Yes, Forest & Bird support the decoupling of the emissions price from the removals price to drive gross emissions reductions and create different prices for different forms of removals. For example, exotic pine forests that are harvested should receive a lower carbon price than longer lived indigenous forests, to reflect that pine forests are only short-term sequestration, as carbon is lost in felling, shipping, processing, and short product life, versus permanent indigenous forests that will sequester for far longer.

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?
Yes, it is critical that greenhouse gas emissions reduce quickly.
5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard to-abate emissions in the longer term? Why/why not?
Yes. Otherwise, we are prioritising business as usual and short term gains over long term viability of the ETS.
5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.
Yes, with the addition of one further key consideration in 5.5 below.
5.5 Are there any additional criteria or considerations that should be taken into account?
Forest & Bird suggest the inclusion of a further key consideration Mitigates against future problems: Avoiding future problems such as the wholesale conversion of the country to a monoculture of exotic trees, susceptible to wind, fire, pests, and that acidify the soil. Or failed transition forests where the cost and difficult of transitioning huge areas of pines to natives proves too costly or difficult.
Chapter 6
6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?
Option 1 – Forest & Bird does not support • Does not address the root problem this consultation is seeking to address. Option 2 – Forest & Bird does not support • Sceptical that offshore buyers could be found for exotic pine NZU's • High cost to Government • Consultation document page: "It therefore functions as a wealth transfer from the public to foresters, with no public benefit" (p.60). We don't want this to occur. Option 3 – Forest & Bird does not support • Consider Option 4 to be superior in terms of driving emissions reductions, mitigating future problems from ETS, and meeting more of our NDC domestically. Option 4 – Forest & Bird supports

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.
Yes
6.3 Of the four options proposed, which one do you prefer? Why?
Forest & Bird prefers Option 4 with the additional polices specified in 6.5 below.
6.4 Are there any additional options that you believe the review should consider? Why?
-
6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?
1. Steadily phase out industrial allocations over the next five years. 2. Introduce vintaging of stockpiled units, so that they are only valid for 2 years. 3. Government to spend money in New Zealand on emissions reductions and removals, rather than purchasing offshore credits to meet our Nationally Determined Contributions (NDC). For example, the estimated shortfall for the 10 years from 2021-2030 that we are planning to purchase offshore credits to meet is a cost of between $3.3 and $23.7 billion. $23 billion is more than 3 times the annual budget of The Department of Conservation over the same 10 year period. 4. Reduce political meddling in the ETS by making it an autonomous entity with a core objective of lowering our emissions in line with our Emission Reduction Plans. 5. A just transitions programme to address any social inequalities or other externalities that are associated with the ETS. 6. ETS income should only be used for climate mitigation, not adaptation.
6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?
-
Chapter 7
7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?
Yes.

• Incentivising indigenous afforestation will help us meet our medium and longer-term removals goals. • Incentivising indigenous afforestation will help mitigate the effects of climate change – reducing flooding and erosion.
7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?
Option 4 appears to have the greatest potential to support co-benefits.
7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?
Yes, inclusion of more valid removal activities should be encouraged. It is good for climate and good for biodiversity. The main rationale presented in the consultation for cautioning against additional removal activities, is concern that it would make it more difficult to meet our NDC's, because emitters would have a greater supply of units. Option 4 would remove this concern. |
7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?
-

Thank you for the opportunity to comment.

Ngā mihi nui
Forest & Bird

Submission by Genesis Energy Limited

ON

Review of the New Zealand Emissions Trading Scheme

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14 June 2023

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Review of the New Zealand's Emissions Trading Scheme

Genesis Energy Limited (**Genesis**) appreciates the opportunity to provide feedback on the Ministry for the Environment's discussion document *Review of the New Zealand Emissions Trading Scheme* (**ETS**).

ETS enhancements supported by complementary policies preferred

We agree that regulations and market settings should be periodically reviewed to assess if they remain fit for purpose. However, we caution against making significant changes that introduce uncertainty and which may have unintended consequences.

A stable and predictable policy and regulatory environment is important. This is because it engenders confidence in the ETS and helps emitters, capital allocators (whether in the public or private sector) and other stakeholders, make informed risk weighted decisions. This is crucial where asset investment/divestment and decarbonisation initiatives span decades.

Uncertainty destroys confidence, adds cost through increased risk premiums for investments and delays decarbonisation initiatives – whether they relate to gross reductions or removals. The worst outcome is lost opportunities to decarbonise because participants choose not to proceed or to allocate capital elsewhere as a result of that uncertainty.

New Zealand Government policy and decisions have had a material impact on both the primary and secondary markets for emission units. Decisions made in the last 9 months in particular, have had a significant impact as shown below.

Source: Bloomberg, Forsyth Barr analysis

Given the recent regulatory and policy uncertainty, New Zealand needs a period of stability and predictability to rebuild confidence in the market and forward price signals.

The market reaction to the 25 July 2023 Government decisions on the ETS auctions settings for the period 2023 – 2028 shows that some confidence is returning.

The ETS must be given time to work, however, and this fledgling confidence is likely to dissipate if Option 3 (two prices for reduction and removal units driven by restrictions imposed on units from removal activities) or Option 4 (two separate markets for reductions and removals) are pursued.

Both represent a fundamental restructure of the ETS and pose wide-ranging implications for participants. In addition to the complexity and uncertainty that they would introduce, they would have a material adverse impact on the property rights of market participants and the value of their investments. Government intervention that has these effects should be considered carefully and only proceed if absolutely necessary. We do not believe the case has been made for such intervention.

If these options are to be explored further, we ask that at a minimum:

(a) Confirmation is provided that these changes would be prospective;

(b) An appropriate transition period would apply.

(c) Bi-partisan support for the changes is sought to reduce the risk of further significant change to the ETS by future Governments.

In relation to Option 2 (expanding the pool of purchasers of units), we agree with the Ministry and the Climate Change Commission that the effectiveness of this option is extremely uncertain.

If it is to be pursued, it is important to first:

(a) Establish that there is (or would be) sufficient demand from overseas buyers.

(b) Determine that the likely impact would drive net emissions reductions that would more than offset the cost to acquire additional international units that New Zealand is forecast to require to meet its NDCs.

Accordingly, we prefer Option 1 (using existing ETS levers to strengthen incentives), supported by complementary policies.

Using the existing ETS framework and settings builds on precedent and promotes confidence in the ETS and the policy approach. This together with complementary policies, such supporting the electrification of carbon intensive sectors like transport and industrial heat should help drive gross emissions reductions.

There are a range of factors in addition to emissions prices that constrain gross emissions reductions (and removals). These include increasing global competition for equipment, technology and people, and at a local level, system / process issues, such as inefficiencies in the resource consenting, grid connection, overseas investment approval and visa / immigration processes.

If gross emissions reductions and removals are important (which we agree they are), then a cohesive policy approach that optimises for this (e.g. fast track OIO and visa approvals, accelerated or new residency categories) should be adopted to incentivise this.

In our view, a holistic approach that uses the existing framework, supported by complementary policies, should be pursued first before seeking fundamental change.

ETS enhancements and complementary policies does not mean incremental change

Genesis has delivered significant gross emissions reductions and is an active enabler of New Zealand's transition to a lower emissions economy.

We:

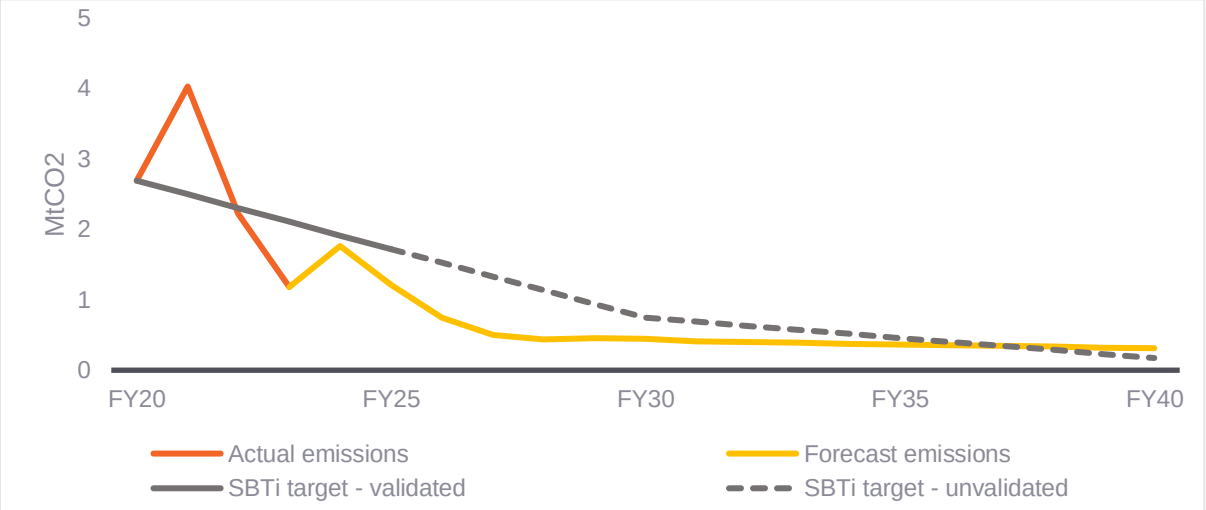
- Are committed to taking action to reduce emissions and balancing climate change considerations, managing increasing energy demand and ensuring our customers have a reliable and cost-effective energy supply.

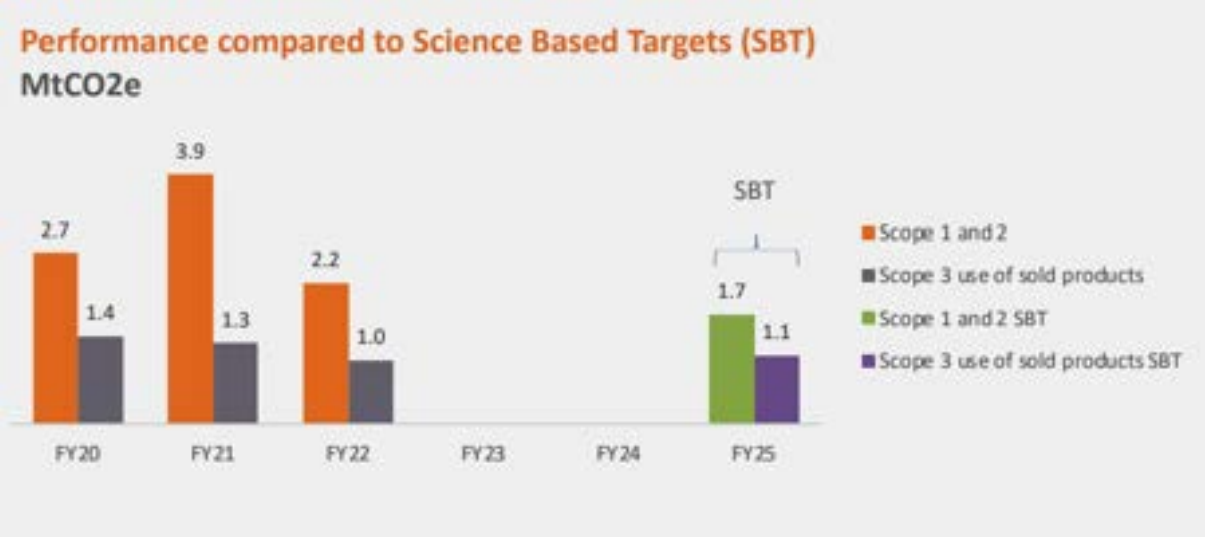
- Have set ambitious emissions reduction targets aligned with limiting global warming to 1.5°C above preindustrial levels to support the country's commitment under the Paris Agreement. Specifically, Genesis is committed to reducing absolute scope 1 and 2 emissions by 36% by FY25

from a FY20 base year and to reduce absolute scope 3 emissions from use of sold products by 21% by FY25 from a FY20 base year. That is a commitment to reduce more than 1.2 million tonnes of carbon dioxide equivalent (tCO2e) by FY25.

- Are making good progress to achieving these targets:

GENERATION EMISSIONS AND SCIENCE BASED TARGETS





- Acknowledge that a large portion of our emissions comes from our thermal generation, which is the generator of last resort when renewable sources are unable to meet demand. We aim to replace 2,650 GWh of thermal energy per annum with renewable energy by 2030 through our Future-Gen strategy. That's the equivalent of around 360,000 homes powered by renewable energy each year.[1]

FUTURE-GEN PROJECTS

	Generation	Capacity	Start Date
Waipipi	450 GWh	133 MW	November 2020
Solar-gen	Up to 740 GWh	Up to 500 MW	Target first generation FY25, full volume by FY27
Kaiwaikawe	230 GWh	75 MW	Target Mid-2025
Tauhara	520 GWh	63 MW	Target January 2025

SOLAR PIPELINE

Early stage feasibility studies	Advanced feasibility	Pre development activities
350 MW	400 MW	52 MW

Genesis has also invested alongside others in a geographically diversified forest portfolio to sequester carbon. This portfolio targets the purchase and licensing of marginal land suited to afforestation. These long-term investments are an important part of Genesis' decarbonisation journey, and are aimed at producing a stable supply of forestry generated emission units and expanding New Zealand's national forest estate in a measured and appropriate way.

These commitments and actions are not incremental. They are significant, and were made and taken, under the current ETS settings.

[1] Based on the average Kiwi home in 2021, which uses 7354kWh of electricity.

In our view, enhancements to the ETS, supported by complementary policies as discussed above, should therefore provide the opportunity to deliver material gross emission reductions and removals.

Please contact me should you have queries or wish to discuss our submission further.

Yours sincerely,

Warwick Williams
Senior Regulatory Counsel & Group Insurance Manager
Genesis Energy

Submission on ETS Review

From Peter Handford, Dougal Morrison and Dr John-Paul Praat, Groundtruth Ltd, Paekakariki.

1. Overview

We have been involved in delivery of sustainable land management solutions to agriculture and forest industries for over 20 years now. This support ranges from planning to project oversight. Latterly our work has included technology transfer and involvement in the NZ ETS. This submission comes from practical experience on the ground working with land managers. Peter Handford is a NZ Institute of Forestry Registered forestry consultant.

Key Message

The main purpose of ETS needs to be significant reduction in fossil fuel use. There must be strong incentives to reduce emissions from fossil fuel combustion. Allow offsets to a point but call the rest what it is – a charge per tonne of CO_2 equivalent emitted which allows emissions to occur, ring fence that emissions charge for effective reductions in fossil fuel use eg efficient public transport, development of infrastructure to deliver renewable energy alternatives . More transparency in this space is required. For example what proportion of emission charges are offset with forestry as compared with actual reductions in emission from fossil fuel use by businesses and how much is a direct charge for emissions?

Fossil fuels contribute over 75.6%[1] of annual global GHG emissions so needs to be major focus. Focusing on offsets and minor gases like biogenic methane which contributes less than 5.8 % to global emissions are essentially red herrings, counterproductive to achieving fossil fuel reductions and obfuscate the real issue (long lived CO_2 in the accumulating in earth's atmosphere from burning fossil fuel). However, higher (at least doubling) energy prices will be the hardest pill for consumers to swallow but unless we go there, fossil fuel use will continue unabated as alternatives are all more expensive. The true cost of oil and it's products are yet to be paid for by the economy, to date their use has been at the cost of the quality of the natural environment.

This is a submission on the MfE discussion document "Review of the New Zealand Emissions Trading Scheme" on proposals to change forestry settings in the New Zealand Emissions Trading Scheme (Publication Number ME 1755).

Key points we wish to make in relation to specific ETS changes discussed in this document are:

1. Choosing to ignore climate change commission (CCC) advice (Dec 2022) lead to a crash in the NZU price from $80+/NZU down to as low as $34. The crash in the carbon market was caused by uncertainty of government direction in this space as it backed away from CCC advice and looked to review ETS rules relating to forestry. New afforestation projects were put on hold which cause major problems for the supply chain (plant production and planting capability) and jeopardised NZ's ability to meet our Nationally Determined Commitment (NDC) in the future. This needs to be addressed quickly.
2. Each of the four options suggested by government add complexity to the ETS, making it harder to administer and work in along with increasing market unease. Increasing

[1] World Resources Institute report 2022 – "4 Charts Explain Greenhouse Gas Emissions by Countries and Sectors"

complexity will increase the opportunity for perverse outcomes and will reduce the potential effectiveness of the NZETS in reducing emissions and supporting removals. We suggest a fifth option – **DO NOT CHANGE THE ETS**. Adopting this approach would be quickest route to get confidence back into this aspect of climate change response by NZ Inc.

3. The major issue the review of the ETS at this time is seeking to address is the behaviour whereby whole farms, mainly sheep and beef, are converted to growing radiata pine for carbon and timber. Ideally a portion (say 10 to 20%) of the current pastoral area of each sheep and beef farm should be retired to some of forestry for improved profitability, adaptation to climate change, improved water protection and increased biodiversity. Further conversion of whole farms to forestry could be stopped by simply banning the practice. Restrictions to landuse change are already in place under regional plans. For example, Waikato Regional Council landuse change rule in "Plan Change1". This rule limits intensification of landuse eg from forestry to dairy, without the a resource consent. Perhaps a rule allow landowners to plant up to say 30% as a permitted activity and apply for a resource consent to plant a higher proportion (note that some farms might be suited to higher than 30% based on LUC and or $EBITDA/ha). Consent conditions could include detailed planting plans with appropriate use of alternative exotic and native species, management plans and harvest plans. Such plans should be reviewed by specialists. As the biomass (vegetation cover) on NZ soil needs to be reported to the UN every 5 years, this approach can be policed at a NZ wide level.
4. A simple and practical addition to the existing ETS administrative system could provide a potential mechanism to influence the mix of new forest species (removals) and support sensible landuse change. Price caps could be placed on the forestry NZU in relation to the expected profitability / return on investment as a function of the forest species planted. Currently NZUs are identified by a suffix eg "NZU_PFSI" which is a New Zealand Unit for a forest registered in the Permanent Forest Sink Initiative category. This could be extended to reflect Look-up table species delineation (radiata pine, exotic hardwoods, exotic softwoods or native). Our economic modelling indicates sensible caps would be in the order of $40/NZU for radiata pine, $80/NZU for special purpose species eg redwoods and cypress and $160/NZU for native.
5. As a corollary to the above, adopt the high emissions charge ($170 - $250/NZU as suggested by CCC) to put pressure on the use of fossil fuels.
6. We suggest no separate treatment of Māori entities is necessary as long as current settings are not changed and the path that the CCC recommends that *"climate response should prioritise gross emissions reductions while maintaining support for removals"* is followed. Important settings include NZU price, non-expiry of NZUs and continued allowance of exotics into the permanent forest category.
7. If other sources of removals are to be added or examined like wetlands and marine then riparian plantings and enhancement of native bush should also be included as they are all relatively marginal potential sources of sequestration as compared with forestry. Presumably these were initially in the same category as soil carbon when it was decided the rewards did not justify the effort required when the ETS regulations were initially drawn.
8. Rather than add more ability to offset, a more tangible approach would be to support existing removals which store carbon. Progress toward recognising (valuing) carbon stored as wood in construction and other long term uses as long as this is associated with reduced use of concrete, steel and plastic, would achieve both reduction in emissions and support of removals, the twin goals of the CCC. The scale of change would likely exceed sequestration by new wetlands. Increasing use of timber will need update of building code, training

designers and builders to use wood in new buildings, big and small which should also include use of alternative exotics or special purpose species such as cypress, redwood and eucalyptus.

9. Maximise the utility of the NZETS as a tool to reduce fossil fuel emissions by publishing or at least facilitate the publishing of the nature and quantum of offsets and emissions charges which businesses such as Z energy, must pay with an NZU for each tonne of CO2 equivalent they produce. As the NZUs can come from forestry offsets or credits (NZUs) issued by the government, publishing the mix of the origin of NZUs (govt or forests) used by a business or industry sector would improve transparency and understanding of how well (or not) the ETS was working.
10. Exotic forest management approaches such as development of continuous cover forestry (ongoing harvest while retaining forest and carbon storage), and transition to native forest species need to be encouraged. Other mechanisms such as extended averaging period, optional choice of a stock accounting method need to be explored to support these approaches. These approaches to forest management have potential to provide multiple benefits in carbon storage, soil and water protection, landscape, biodiversity and local employment.
11. The idea of recognising co-benefits - environmental outcomes with removals, eg biodiversity credits, maybe water quality protection is worth significant consideration. If done correctly this could add value to NZUs from projects with native forests or with native forest as a component. Ideally this should piggy back on the existing ETS which has the system and in relation to existing NZUs through a specific NZU identifier. This could for example reward successful pest and weed control activities in native and exotic forests.

Submissions on wider issues/policy

The ETS will not work in isolation to reduce greenhouse gas (GHG) emissions. Supporting sensible landuse change, recognising carbon in longer term timber use are important but we also wish our additional commentary and points to be taken into account.

1. Develop a more nuanced approach to bringing Agriculture into the ETS. Most of the increase in GHG emissions in NZ has come from the increased use of fossil fuels (50+% increase) whereas the increase in emissions from ruminants in that same period is less than 10%. The extent of the tax on agricultural emissions should be limited to that increase. Establish consistent (one calculator) farm level GHG reporting at both an enterprise level (Gross GHG emissions) and at a per hectare level. Once that is operating then implement a tax (or rebate) on increased (or decreased) emissions per hectare. Economic analysis of sheep and beef farm businesses show their cash flows will not cope with significant tax on GHG emissions. The long term prosperity of NZ Inc will require viable land management businesses on land suited to sheep and beef production. The value of climate change, water quality and biodiversity benefits will likely be more improved by supporting these businesses rather than sending them to the wall financially.
2. The review of East Coast forestry in the wake of recent storm events has highlighted the value of systems thinking in primary production. We suggest more practical support for integrated use of biomass for energy (lowest cost, easiest transition). Practical solutions will reduce forest waste and consequent debris avalanches along with increased implementation of good forest management practices. Higher prices for fossil fuels would support increased use of biomass in energy production.

HIRINGA ENERGY SUBMISSION

Ministry for the Environment
Manatū Mō Te Taiao

REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME

Aug 2023

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1. Executive Summary

1.1. Hiringa Energy recognises the significant role that the Emissions Trading Scheme (ETS) plays in New Zealand achieving its emission reduction commitments and we welcome the opportunity to provide feedback on *Te Arotake Mahere Hokohoko Tukunga (the Emissions Trading Scheme)*.

In summary, our key recommendations are:

1.2. Separating carbon removal and gross emission reduction markets enables targeted incentives and policies that can drive the most beneficial outcomes on both sides of the carbon ledger.

1.3. Businesses require policy certainty in order to invest in low-emission technologies. We urge that the ETS be kept free of political interference to manage other contemporary issues such as the cost of living.

1.4. We support ETS settings that encourage business and industry to incorporate the cost of climate change into business decisions throughout the economy and make lower emission choices today as opposed to offsetting emissions with forestry. This will be critical if New Zealand is to have the supply chains in place to transition to low-emission technologies at scale over the coming decades.

1.5. Limiting the amount of NZUs generated via carbon removals that organisations can use to offset their emissions would result in the faster uptake of low-emission technology in the near term.

1.6. We support the Climate Change Commission's recommendation for a price corridor at auction that drives the uptake of low-emissions technology and practices as quickly as real-world constraints allow.

1.7. Relying solely on a carbon price without policy settings and private and public sector investment in clean technologies and infrastructure will not transition our economy, but instead result in increased costs for businesses and a loss of international competitiveness.

1.8. Refined policies and incentives that help address near term technology costs and infrastructure barriers to create an even playing field between incumbent fossil fuels and new clean technologies are required to expedite decarbonisation.

1.9. We recommend the implementation of simple and non-contestable carbon crediting mechanisms in parallel to the ETS. This is a recognised approach across multiple OECD countries. A good example is the use of the Californian Low Carbon Fuel Standard (LCFS) combined with their 'cap-and-trade' system (ETS equivalent). For low-emission fuel producers this could take the form of fuel production credits or rebates.

1.10. If a mechanism such as the Californian Low Carbon Fuel Standard or Australian ACCU system was implemented, it would need to be greatly simplified for the smaller New Zealand market avoiding lengthy and costly system design and high ongoing administration costs and ultimately delaying quick win emission reductions.

1.11. Incentivising freight decarbonisation should be prioritised due to it providing good carbon abatement per dollar spent within the transport sector, a key focus of the Climate Change Commission in Emissions Budgets two and three.

1.12. Green hydrogen is a 'now' technology that can decarbonise many hard-to-abate parts of our economy by creating a pathway for our renewable electricity to be used as a substitute for hydrocarbon-based liquid fuels and industrial feedstocks. It has a particularly important role to play as it can used directly as a fuel replacement and is also the fundamental molecule required for the production of low-emission replacement fuels such as SAF (sustainable aviation fuel), eMethanol, green ammonia, green methane, and green synfuels, and for the hydrogenation of biofuels.

1.13. We support Option 4 as the pathway that would enable Government to have the most targeted market interventions on both the carbon removal and emission reduction sides to mitigate unintended consequences, drive gross emissions reductions and keep New Zealand instep with the climate expectations our global trading partners.

2. Key messages

2.1. Address gross emissions reductions independently of net emissions

Global gross emissions determine our impact on climate change. We cannot rely too heavily on carbon removals to meet emission reduction targets. It's important to note that while carbon sequestration plays a critical role in reducing gross emissions, it is not a standalone solution. To effectively address climate change, a comprehensive approach is needed that incentivises not only carbon sequestration but also low-emission technology adoption to reduce emissions at source.

Separating carbon removal and gross emission reduction markets enables targeted incentives and policies that can drive the most beneficial outcomes on both sides of the carbon ledger. Individual but aligned frameworks for removals and gross emission reductions will enable each to function independently and avoid short term disruptions from either side creating negative impacts on the other.

New Zealand is one of the only countries in the world that does not limit the number of units from carbon removals that can be used by emitters to offset their emissions. To date there has been significant investment in exotic forestry to generate NZUs and attract the associated income given its sometimes higher financial return when compared to other land uses. While this investment helps New Zealand sequester carbon and lower its gross emissions, modelling shows that the NZU supply generated by these forests may exceed the number needed by emitters with time.[1]

If there are too many lower-cost NZUs available for purchase due to oversupply, the price of NZUs will drop. Emitters looking for the cheapest way to decarbonise would naturally choose these low cost NZUs over a higher abatement cost associated with adopting low-emission technology, with the latter being critical if we are to enable our economy to transition to low-emission technology at an incremental pace and at a lower cost (when compared to trying to transition faster later on).

Deploying funding assistance to emissions reduction technology that enables it to become commercially sustainable faster will place the lowest burden on the Government and New Zealand economy in the mid to long term.

2.2. Aotearoa's global competitiveness depends on reducing domestic emissions

It is becoming increasingly important that Aotearoa/New Zealand aligns itself with the ambitious emissions reduction programmes of our global trading partners if the exporting of goods is to continue to underpin our economy in the way it does today. A case in point is the recently signed New Zealand and European Union Free Trade Agreement which "contains ambitious outcomes on climate action and the Paris Agreement, including making these commitments enforceable in the Agreement."[2]

[1] https://environment.govt.nz/assets/publications/climate-change/Review-of-the-New-Zealand-Emissions-Trading-Scheme-Discussion-Document.pdf
[2] New Zealand and European Union Free Trade Agreement | Ministry Foreign Affairs & Trade

2.3. NZU prices should not be used by the Government as a cost-of-living support tool

We concur with the Climate Change Commission in that the key intended impact of emissions pricing should be to reward choices that reduce emissions. Households and businesses who switch to low-emissions options reduce their exposure to the emissions price and will likely reduce their overall costs.

Not all households will be able to afford to switch to low-emission options. Targeted assistance for those who need it is a better option than delaying emissions reductions by keeping the price of carbon low via political intervention. To fund this targeted assistance, the Government can use a stable ETS with predictable cashflows to resource the existing (and proposed) suite of tools in the tax and welfare system.

2.4. Predictable and transparent carbon price is required

A predictable and transparent carbon price is required to drive the investment and behaviour change required for New Zealand is to meet its 2050 net zero emissions target. If the Government's commitment to climate policy and the ETS is unclear it will result in volatility in the emissions price.

Hiringa supports the recent 'annual update' to the ETS that reduces the number of units available, ratcheting up the auction floor and cost-containment reserve trigger prices over time.[3]

We support the Climate Change Commission's recommendation for a price corridor at auction that drives the uptake of low-emissions technology and practices as quickly as real-world constraints allow.

NZU prices will need to rise steadily to drive material gross emissions reductions, alongside complementary policies to drive reductions in areas that are not as responsive to carbon price in the short term e.g. vehicle owners might wait until their next vehicle replacement unless incentivised beyond the price of carbon increasing.

2.5. A coordinated package of measures is needed to deploy low-emission technology

We concur with the Government's decision to adopt a portfolio approach, that is, "a mutually supportive and balanced mix of emissions pricing, well-targeted regulation, tailored sectoral policies, direct investment (public and private), innovation and mechanisms that help nature thrive. The portfolio approach reflects the fact that no one policy instrument, including emissions pricing, can achieve the necessary emissions reductions and removals that are needed to achieve our climate change goals."

Hiringa strongly recommends that incentives be put in place that encourage emitters towards reducing their gross emissions by way of transitioning towards low-emission alternatives where available. There are a wide variety of low-emission technologies on the cusp of commercial sustainability, that with the right carbon accounting system and policy settings in place, can

[3] Government announces updated NZ ETS auction settings | Ministry for the Environment

decarbonise even our hard-to-abate sectors e.g. green hydrogen, green ammonia, eMethanol and sustainable aviation fuel.

We acknowledge that the Government is progressing the development of a Voluntary Carbon Market (VCM) framework with the additional emission reductions that can be achieved through a VCM sitting outside of the ETS. We would encourage this framework to incentivise New Zealand businesses to transition to low-emission technologies as opposed to providing a way of offsetting their emissions through the purchasing of carbon credits from international carbon markets or Aotearoa's Permanent Forest Sink Initiative as suggested (which may not produce enough carbon removal units to keep up with demand).

The Australian Carbon Credit Unit (ACCU) system is a functioning example whereby businesses are incentivised to adopt low-emission technologies, generate carbon credits and then sell these via their mainstream regulated carbon market. This multi-benefit approach encourages businesses to adopt low-emissions technology while generating income to offset the cost of low-emission technology adoption.[4]

There are however challenges with the ACCU system as follows:

i. Diversity of use cases adds complexity

   Given ACCUs are created based on the additional abatement associated with specific activities, they are having to develop a large number of carbon accounting methods to cover the diverse range of use cases. If a similar system was deployed in New Zealand a more generic approach may need to be taken that might be based on an average level of abatement associated with a class of related use cases. An example of this would be the use of green hydrogen in transport as a diesel or petrol substitute, where actual abatement will vary based on the types of vehicle, ranging across hydrogen fuel cells, hydrogen combustion, dual-fuel partial substitution, on and off road vehicles, and vehicles ranging in size from small cars to the heaviest trucks.

ii. Fragmentation of users

   Given ACCUs accrue to the entity creating abatement, the transport example also highlights a challenge where the end customers may range from major transport operators through small businesses (such as smaller trucking operators) to individual truck owner/drivers. Many of these smaller operators/individuals would not be in a position to register a project and create ACCUs, and so an alternative would be needed. We understand there is a precedent for this in the case of renewable methane in Australia, where ACCUs can be created earlier in the value chain. In our example of road transport, we suggest this could be the producer or retailer of the green hydrogen should a similar framework be deployed in New Zealand.

California's Low Carbon Fuel Standard (LCFS) is a system specifically focussing on the transportation fuel industry that regulates the carbon intensity of fuels via standardised carbon

[4] Emissions Reduction Fund | business.gov.au

accounting methodologies. The CLCF has had a major impact increasing the use of low-emission fuels by 50% between 2011 and 2016. The CLCF is complementary to the 'cap-and-trade' programme (ETS equivalent) in California which is helping to integrate the costs of climate change into business decisions throughout the economy while the LCFS is supporting investments in the deployment of clean technologies through the 'cap-and-trade' programme revenues.

We recommend the implementation of simple and non contestable carbon crediting mechanisms in parallel to the ETS (such as the LCFS) as the most effective way of transitioning our transport sector to low emission technology as demonstrated in California.

2.6. Incentivising freight decarbonisation should be prioritised due to investment efficiency

It is critical that money accumulated by Government via the ETS is used to incentivise decarbonisation where the greatest carbon abatement per dollar spent can be achieved.

We support the Government developing more accurate assessments of the costs of emissions reductions in different sectors to improve the MACCs the government uses for climate mitigation policy. Ensuring that the highest carbon abatement per dollar spent is achieved is in the best interests of all New Zealanders, and this is where Government policy and investment should be focussed.

The Clean Car Discount Scheme has been successful in incentivizing the uptake of zero emission light vehicles. However, on a dollar per tonne of carbon abatement basis, this scheme costs the Government around $410 per tonne.[5] As demonstrated in Figure 1 it would be more cost effective for the Government to support the decarbonisation of heavy trucks (50 tonne GVM doing between 150,000 and 180,000kms/annum) which would cost between $150 and $200 per tonne of carbon abatement via an equivalent scheme.

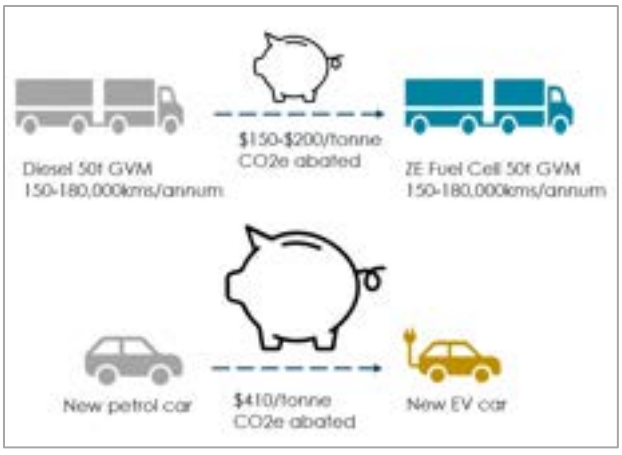


Figure 1 Decarbonising heavy trucks has a lower cost/tonne CO2e abated than light vehicles

The abatement cost of reducing emissions from heavy freight vehicles is lower than many other applications while also providing a significantly easier pathway to scaling up decarbonisation impact as more carbon is abated per vehicle.

[5] https://www.transport.govt.nz/statistics-and-insights/fleet-statistics/sheet/2021-annual-fleet-statistics

A prudent approach to reducing New Zealand's transport emissions would see us tackle transport emissions from both the small vehicle and heavy vehicle ends of the sector. Heavy vehicles comprise ~23% of our transport emissions, but only account for 6% of the annual road vehicle kms travelled.[6] Freight volumes are expected to increase 33% by 2050[7] meaning this source of emissions has potential to grow unless we develop the supply chain for zero emission freight technology today.

Zero emission hydrogen technology for heavy trucks is now becoming available and presents a critical opportunity to meet our emissions reduction budgets, with the ability to become commercially sustainable faster than other applications. However, it requires initial stimulus to scale the supply chain in the short term and reduce costs. This CAPEX support is only needed in the early years to activate the supply chain. Zero emission hydrogen heavy truck and refuelling technology are being introduced into New Zealand and will be operational late 2023. Figure 2 demonstrates the range of heavy fuel cell trucks that are on the road today and those close to market.

Figure 2 Global OEMs producing heavy hydrogen fuel cell trucks

Hiringa supports the 'benchmarks for action' in table 2.3 of the Climate Change Commissions 2023 Advice targeting 36% of trucks entering the fleet and 3.6% of the total truck fleet being zero emission trucks by 2030, however we can do better. The need to decarbonise Aotearoa's transportation sector coupled with the availability of zero emission trucks of all kinds and their refuelling infrastructure ramping up means we can be more aggressive with our targets.

The Grant Scheme for Clean Heavy Vehicles announced as a part of Budget 2023 is a positive step, but it is insufficient in size and its contestable nature causes uncertainty. Because it is open to lighter vehicles (over 3.5 tonnes) it will likely be spread across a combination of projects with

[6] https://www.transport.govt.nz//assets/Uploads/Discussion/Transport-EmissionsHikinateKohuparaDiscussionDoc.pdf

[7] https://www.sbc.org.nz/insights/2021/low-carbon-freight-pathway

varying emission reduction benefit. This fund would have a far greater impact on emissions reduction if it were focussed on heavy vehicles (>20 tonnes).

There is an existing price premium for zero emission heavy trucks that is hindering their uptake, which is related to the early stage of development of the segment, with relatively low volumes and a lack of manufacturing scale. A current example is that due to low order volumes, fuel cell truck integrators are currently forced to purchase base chassis (gliders) from OEM's that include the diesel engine and mechanical drive train, which then needs to be removed to install a hydrogen fuel cell, battery and electric drive train. Incentives are needed to stimulate the initial stage of deployment and accelerate cost reductions. By addressing the difference in price compared with an equivalent diesel vehicle. In the early stages of adoption, such incentives provide upfront certainty and provide the purchasing volumes to drive investment in vehicle production and the costs down.

We concur with Hyundai NZ's suggestion for funding a meaningful freight decarbonisation scheme being to 'ring fence' a portion of the approximately 16 cents per litre added to the price of fuel at the pump by current ETS settings for the decarbonisation of the trucking. If 6 of the 16 cents paid by diesel truck operators was directed into a freight decarbonisation scheme it would accumulate approximately $244 million per annum.

- Heavy trucks would receive a $683,000 rebate. If 250 trucks were bought per year the total Government financial redistribution would be $171 million for this segment.
- Medium trucks would receive $167,000 rebate. If 227 trucks were bought per year the total Government financial redistribution would be $38 million.
- Light trucks would receive $68,000 rebate. If 230 trucks were bought per year the total Government financial redistribution would be $16 million.

A system such as this would not further penalize diesel truck operators (like the ute-tax) at a time when any increased costs for them would further exacerbate the 'cost of living crisis' faced by consumers. The amount of funding accrued via this closed loop system would give the Grant Scheme for Clean Heavy Vehicles enough money to swiftly and effectively activate the low-emission freight market.

When considering vehicle types to target with emissions reduction in mind, Figure 3 demonstrates that decarbonising heavy trucks (>40 tonne GVM) doing an average 150,000km per year abates 20 times more carbon dioxide per vehicle when compared with light trucks (<10 tonne GVM) doing an average 10-15,000km per year. All candidate technologies should be supported to establish their most competitive decarbonisation niche (in terms of abatement cost and customer acceptance), but Government must remain cognisant of abatement efficiency when deploying incentives to ensure best value for money is achieved.

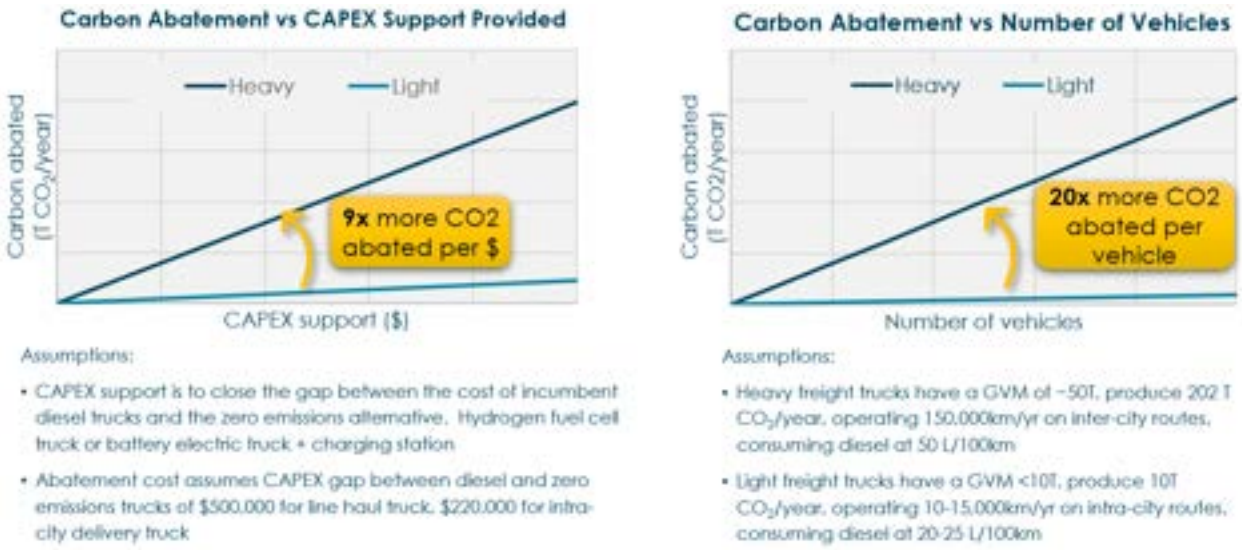


Figure 3 Decarbonising heavy freight trucks (>40t) is more impactful and cost efficient than light freight trucks (<10t)

A zero emission Government supply chain mandate by 2025 under the Carbon Neutral Government Programme would incentivise providers of goods and services to adopt zero emission vehicles if they wanted to bid for Government contracts. This is a low-cost initiative that could be swiftly implemented and would drive decarbonisation within the freight supply chain.

2.7. Green Hydrogen and Power-To-X are a key part of the Emissions Reduction Solution

IRENA sees Power-To-X commodities such as green ammonia, green hydrogen and eMethanol comprising approximately 25% of the global energy commodity trade by 2050.[8] New Zealand needs to start enabling the production, storage and transport of these commodities today if we are to protect access to our export markets, achieve energy sovereignty, manage decarbonisation costs to businesses and potentially achieve a portion of global market share given our advantageous renewable electricity production capacity.

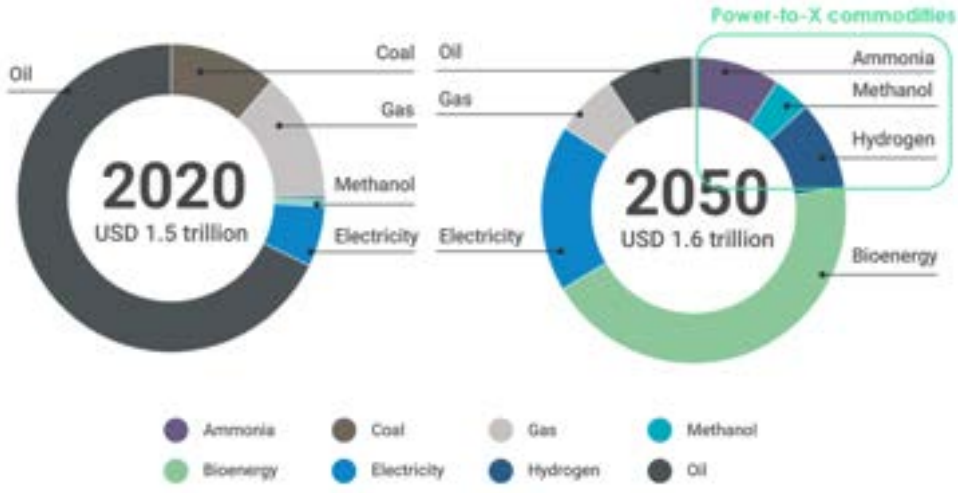


Figure 4 Shift in the trade of energy commodities, 2020 to 2050 (Source: IRENA, 2022)

[8] https://www.irena.org/

Power-To-X is crucial in order to decarbonise our vital hard-to-treat sectors such as cement, steel, glass, chemicals, fertilisers, and heavy transport which underpins our domestic and export supply chains (land, sea and air). Globally it is recognised that the decarbonisation of these sectors can only be achieved at the scale necessary by using renewable electricity to produce green hydrogen and its derivatives such as green ammonia, green methane, green methanol, green synfuels and other commonly used chemicals (refer to Figure 4). These sectors are currently powered by fossil fuels with many use cases unable to switch to renewable electricity due to the need for molecular energy. EECA's graphic in Figure 5 demonstrates that around 70% of New Zealand's primary energy came from fossil sources in 2021.

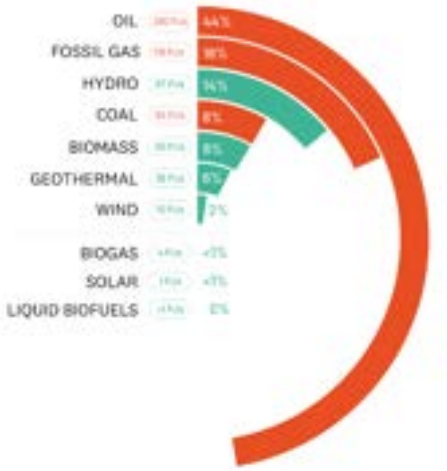


Figure 5 Primary energy consumption in New Zealand (Source: EECA)

There are a number of technologies available today that can help decarbonise New Zealand's large industrial greenhouse gas emitters, with green hydrogen being one of them. With the right policy settings and incentives in place large industrial emitters can be encouraged to adopt low/zero emission technology available in emissions budget two instead of receiving free allocations and/or offsetting gross emissions. The industrial sector does not need to wait until after 2030 (emissions budget three) to decarbonise.

2.8. Efficient decarbonisation investments are aligned with positive Just Transition outcomes

Sector coupling projects are underway across the globe that interconnect high energy consuming sectors (such as industrial manufacturing, energy, transport and industrial heating) with power production and storage. There are numerous regions within New Zealand such as Taranaki where coordinated sector coupling like this would expedite emissions reductions in hard-to-abate sectors while creating new green jobs.

The development of a Power-To-X economy would provide Taranaki the opportunity for the 'Just Transition' away from oil and gas that has been talked about for some time. The Taranaki economy and wellbeing of its people would benefit greatly if clarity and certainty were provided around the price of carbon and therefore the pace of Aotearoa's transition and therefore need for low-emission Power-To-X commodities such as eMethanol, green ammonia and sustainable aviation fuel.

Large scale new renewable generation for the production of green hydrogen is required for the production of all low-emission fuels. This is because the hydrogen molecule is the basic building block of these synthetic fuels and is also required for the hydrogenation of biofuels.

Hiringa has built a team of 30 professionals based in Taranaki, with many drawn from the oil and gas industry, providing a tangible example of the ability to transition oil and gas industry expertise into new renewable energy industries. However, the region will require the acceleration of these new industries to retain and develop talent and support the regional economy.

2.9. Targeted incentives for carbon removal methods should be transparent and available

There are different types of carbon removal activities including both temporary and permanent carbon removals, which should be incentivised and managed separately in an ETS system that is transparent and as predictable as possible.

Exotic forests intended for harvesting in the future provide a genuine carbon reduction benefit while growing but should be treated separately to permanent native afforestation which bring a wide variety of intergenerational benefits.

Direct air capture (DAC) and other CO2 absorbing technologies can be part of temporary or permanent carbon removal systems. Carbon that is captured and then used to create eFuels such as eMethanol and Sustainable Aviation Fuel (SAF) has a temporary and short cycle of emissions reductions, which may benefit from avoiding exchanges with the ETS by allowing consumers to exclude emissions from their combustion.

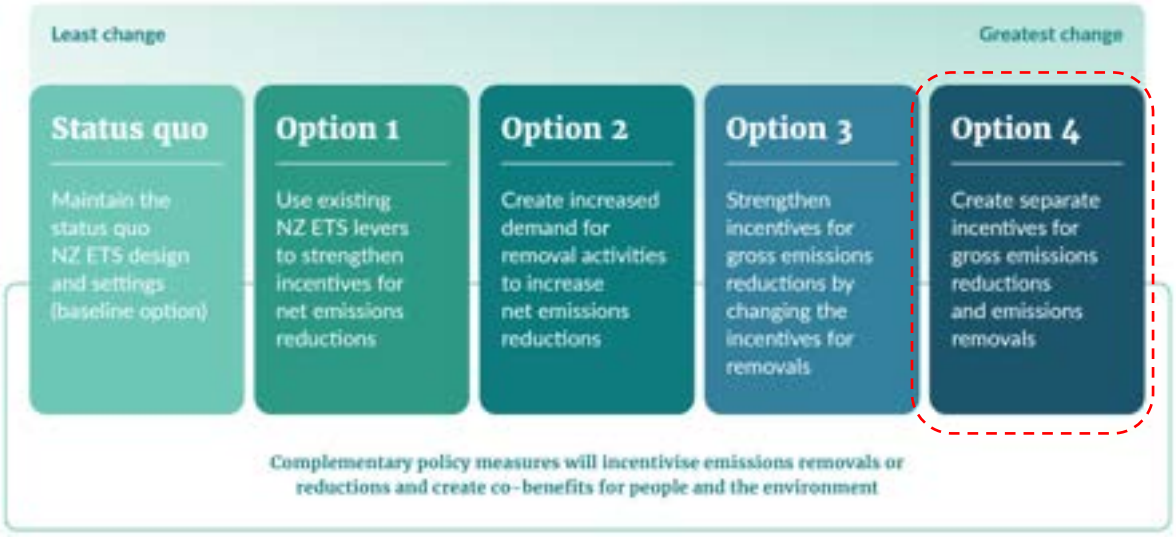
New Zealand needs to develop a CO2 supply strategy given the increasing demand for biogenic CO2 for making eFuels. Activating a domestic CO2 market would drive both CO2 capture and increases energy sovereignty by avoiding the import of zero emission fuels for hard-to-electrify sectors.

3. Preferred of the Proposed Options

The existing ETS is not delivering the emissions reductions required for Aotearoa to meet its net zero 2050 target and therefore change is required. Greater incentives need to be in place for New Zealand businesses to adopt zero emission technology. Much of the required technology is available today but needs financial support to establish itself in the market.

We therefore support Option 4 as the pathway that would enable Government to have the most targeted market interventions on both the carbon removal and emission reduction sides to mitigate unintended consequences, drive gross emissions reductions and keep New Zealand instep with the climate expectations our global trading partners. We acknowledge that Option 4 would require the greatest overhaul of the existing ETS system but now is the time to be bold and make the big changes required to get the zero emission technologies and their supply chains in place to achieve a thriving low-emission economy by 2050.

Figure 2: Proposed options to strengthen the incentives for gross emissions reductions in the NZ ETS



Below summarises the reasons why we recommend Option 4:

a. Option 4 would create two markets with independent and targeted price and volume controls, one system for removal activities and one system for gross emissions reduction activities, both working toward the same end game of our net 2050 target.

b. Decoupling the removals and emissions markets allows the Government to set transparent and predictable prices and volumes for each market to avoid destabilisation of either market when a change occurs in the other. This would increase investor certainty which will ultimately result in greater gross emissions reduction due to increased decarbonisation pathway clarity for investors.

   i. For the removals market, being isolated from changes in technology or energy markets affecting the demand for emissions credits will reduce volatility in the value of selling carbon removals.

   ii. For the emissions market, being isolated from changes in forestry settings affecting the supply of low cost reductions will reduce volatility in emissions costs.

c. It is widely understood that a higher carbon price is required to drive down gross emissions. However, as the price of carbon increases, so too would the incentive for forest growers looking to gain from the increasing payback. An oversupply of forestry derived NZUs is already anticipated from early 2030.[9] Therefore decoupling forestry removals from the ETS used by emitters can curb the environmental, social, economic and cultural issues associated with excessive forestry as well as causing NZU price volatility during forestry boom times.

[9] https://environment.govt.nz/assets/publications/climate-change/Review-of-the-New-Zealand-Emissions-Trading-Scheme-Discussion-Document.pdf

d. Government is able to develop a purpose-built framework by which it pays forestry owners for tonnes of carbon removed and is able to review/adjust this framework as needed without impacting the stability of the price of NZUs. Incentivising permanent forest sinks and wetlands come with additional biodiversity and cultural benefits and can enhance New Zealand's clean-green image which in turn aids all parts of our economy.

e. The separate market for emitters gives Government direct control over gross emissions. If emitters could not use removals to meet their mandatory surrender obligations, the Government would be able to control the incentives to reduce gross emissions through unit supply settings. As a result, the Government could encourage emitters to reduce their gross emissions more than they currently do today via offsetting. Refer to section 2.5 re VCMs.

f. Government is able to use the existing ETS as the framework for incentivising emitters to either buy NZUs or adopt low emitting technologies. If NZUs were priced appropriately and viewed as rising in a predictable manner they would encourage parts of our economy to adopt low-emission technology where the technology is available. This adoption of low-emission technology should be the ultimate aim of the ETS. Encouraging the adoption of low-emission technology as early as possible will put New Zealand in the best position possible to meet our 2050 net zero target because new technology takes time to 'bed in'.

g. Option 4 gives the Government more control over the unintended side effects that a rising cost of carbon would have on the cost-of-living as the price of energy and transport costs increase over time. The Government will earn more revenue from emitters as the NZU price increases over time. Assuming that the price of NZUs at auction will be higher than the price the Government purchase removal units for there will be a growing amount of funds available for deployment via policies that target those within our communities who need the most support during the transition.

11 August 2023

ROA0501
RK:MR

NZS Review
Ministry for the Environment
PO Box 10362
Wellington
via etsconsultation@mfe.govt.nz

HORIZONS REGIONAL COUNCIL SUBMISSION - REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME AND A REDESIGNED NZ ETS PERMANENT FOREST CATEGORY

Thank you for the opportunity to submit on these proposals. Horizons Regional Council is the regional authority for the Manawatū-Whanganui Region, extending from south of Levin to north of Taumarunui and from Whanganui across to the east coast, covering an approximate 22,000 km² in total.

The Intergovernmental Panel for Climate Change Sixth Assessment Report (AR6), found that to meet the Paris Agreement, a 43% reduction of global greenhouse gas emissions is required by 2030. We acknowledge that for Aotearoa/New Zealand to play our part to reach that goal, exotic forests have a role to play. They are also an invaluable resource for construction, as an alternative energy source, and in other emerging applications. In the short-term, we need to continue to sequester carbon in forests while we make changes to reduce our gross emissions. Native forests cannot match the ability of exotic species to take up carbon quickly.

Nonetheless, we believe that the NZ ETS's focus for exotic forestry should remain on harvest. The only exceptions to indigenous forest for the Permanent Forest Category should be to:

- Meet Te Tiriti o Waitangi obligations for Iwi/Māori.
- Allow 'right tree, right place' for erosion/sediment control.
- Allow long-lived exotics where they are fit for purpose for site.

NET AND GROSS EMISSIONS REDUCTION ARE BOTH REQUIRED

Aotearoa/New Zealand cannot plant its way out of climate change; gross emissions must also decrease. While forestry plays a role in both emission reduction and climate adaptation, emission reduction targets are unlikely to be met without reducing gross emissions. Horizons already significantly contributes to plantings through its erosion control and riparian management programmes. Our emission reduction target is nevertheless a gross target. We are committed to reducing emissions rather than offsetting them.

Horizons recognises that there are issues with an overreliance on offsetting that risks maladaptive outcomes. Future generations should not be unduly limited in their adaptive options as a legacy of offsetting. However, to achieve short-term net emission reduction, we acknowledge that the ETS has an important role to play. We need to continue to sequester carbon in forests while we make changes to reduce our gross emissions and balancing land-use requirements now and in the future.

horizons
REGIONAL COUNCIL

THE HORIZONS REGION NEEDS THE RIGHT TREE IN THE RIGHT PLACE

Just as the long-term risks of overreliance on exotic forestry are significant, the potential benefits of re-establishing natural forest ecosystems are wide ranging and can build climate change resilience. We strongly support changes to NZ ETS settings and incentives to promote the 'right tree in the right place'.

Our region includes the largest tract of unconsolidated hill country in Aotearoa/New Zealand. Hill country erosion is a significant issue for our region that will worsen as the climate changes, unless there is significant extension of erosion control activities. Afforestation is a key erosion control measure in our region. Any changes to NZ ETS direction for the role of forests needs to ensure that the vital role of afforestation as an erosion control measure is maintained. It needs to regulate and incentivise plantation forest placement and management in a way that will avoid repeating the devastating consequences seen in Tairāwhiti, Hawkes Bay, and within the Tararua District following Cyclone Gabrielle.

The Emissions Trading Scheme is susceptible to boom/bust cycles that influence investment, land, and unit prices. Without policy and investment to encourage 'right tree in the right place', the broader co-benefits of NZ ETS registered forests may not be realised. Horizons has extensive experience though the Sustainable Land-Use Initiative (SLUI) in planting erosion prone land. The NZ ETS has incentivised rural landowners to join SLUI. Erosion control requires the use of various exotics as well as natives. The right tree species for a site depends on a number of factors. Horizons has experience and expertise in erosion control.

The solution in part to the Ministerial Inquiry into Land Use's recommendations, is to pursue a more nuanced version of a mosaic of sustainable land uses – both protective and productive – that are more appropriate to their place in the landform. Within the existing red zone, there is some land that is too susceptible to erosion to be used for forestry or farming. We propose this land needs to be identified in the Erosion Susceptibility Classification (ESC) as having 'extreme erosion susceptibility' and be mapped as a 'purple zone'. This land must be returned to permanent forest – preferably native – which would have the advantage of biodiversity co-benefits. Identifying that land at a management unit scale requires higher-resolution information than is currently available. Forestry practices must adapt to better reflect the fragile landscape.

We agree with the consultation document that the NZ ETS settings need to incentivise native forests. Regulatory settings can only achieve so much, incentives to plant indigenous forestry are required. As the consultation document notes, regulatory restrictions won't address financial barriers to planting indigenous forests – incentives are needed. Future certainty is also needed for investors as high establishment costs, lower success rate and slower sequestration can be off putting to investors.

The high cost of establishment and low rate of carbon sequestration presently combine to make native forestry economically unattractive in comparison to exotic species in most cases. The case for planting natives revolves around co-benefits for communities and the environment. Ecosystem services are not well-represented in current markets. Regulation – ideally, linked to spatial plans for the catchment area – have a part to play in avoiding inappropriate changes in land use. At the margin, some foresters may be swayed by better information about the wider benefits of indigenous forests, or guidance on how to grow them successfully. Some may be able to draw on community groups for volunteer labour. But, if we are to accelerate native reforestation significantly, the economic imbalance also needs to be addressed. Financial acknowledgement of the co-benefits must occur to promote indigenous forestry, such as higher value credits for natives. A precedent for this type of measure has already been set, through the existing industrial allocation regime

PERMANENT FORESTRY

In our region, for permanent forest, 'right tree in the right place' is likely to be indigenous forest. Re-establishing permanent indigenous forests and other habitats will assist in addressing both the climate and biodiversity crises though an indigenous forest is not automatically biodiverse. The NZ ETS has a role to play incentivising indigenous forest that will support long-term biodiverse habitats.

Horizons agrees that the permanent forest category should be restricted to exotic species with a low wilding risk. Horizons bears a significant financial burden managing wilding conifers originating from planted sources. This is primarily Pinus contorta planted for either forestry, shelterbelts or erosion control, but a number of other species are similarly planted for production or other services. These have created infestations, requiring removal to prevent spread to highly vulnerable landscapes and prevent transformation. Reducing the future risk of spread to vulnerable landscapes from ETS planted forests, especially those recently relieved of a wilding burden, will ensure they remain protected from transformational change and the many millions of dollars spent since the 1980s to create this cleared asset are secured.

In regards to which forests should be allowed in the permanent forest category, Horizons supports a combination of options 1.2a, b and c. These options will allow some land-use autonomy for whenua Māori. We support including long-lived exotics as permanent forests where they are the 'right tree in the right place.' That category would need a robust framework, based on sound evidence to ensure that the right tree is used in the right place. We know that to effectively control erosion through planting, our tool kit needs to include a wide variety of species for permanent forests. Our support for 1.2c is to support the SLUI programme and broader erosion control activities.

We agree with the concern expressed that there is a lack of understanding of transitional forest impacts and effective forest and pest management. There are already examples in our region where damaged exotic forests have led to invasive pests establishing or expanding range. We are particularly concerned about the biosecurity/wilding risk of transitional forest. A precautionary approach should be applied to any transitional forests category until enough is known to define and mitigate risks.

IWI/MĀORI AND LOCAL COMMUNITIES

Iwi/Māori are major rural landholders in our region. Much whenua Māori is steep, landlocked or erosion prone and is suitable for some form of forestry. To give effect to the principles of Te Tiriti o Waitangi, specifically partnership and tino rangatiratanga, NZ ETS changes need to be developed with Iwi/Māori. Not doing so would risk perverse outcomes if the changes do not align with Māori aspirations.

Some communities in our region are concerned about afforestation adversely impacting their communities, feeling powerless to influence where and what afforestation occurs. For those communities, input into land-use and change around them is a pressing concern. We are pleased to see that community considerations are included in outcomes.

Horizons supports the five outcomes for the redesign of the permanent forestry category. However, these outcomes are not written in sufficient detail or in a form that makes them sufficient to be assessment criteria. We recommend that specific assessment criteria are developed at a level of detail to assess outcomes. Assessment criteria can be developed with Iwi/Māori and local government to ensure they reflect mātauranga Māori and local government expertise and experience.

KEY POINTS

- Horizons supports the 'right tree in the right place', preferably native, for sediment control.
- The NZ ETS has a role to play in incentivising indigenous forest that will support long-term biodiverse habitat. Horizons agrees that the NZ ETS settings need to incentivise native forests. Financial acknowledgement of the co-benefits must occur.
- The only exceptions to indigenous forest for the Permanent Forest Category should be to
  - Meet te Tiriti o Waitangi obligations for Iwi/Māori.
  - Allow 'right tree, right place' for erosion/sediment control.
  - Allow long-lived exotics where they are fit for purpose for site.
- Community input into land-use and change around them must be included in outcomes.

Thank you again for the opportunity to submit on these proposals. For further information please contact Maria Reiche – [redacted]

Yours faithfully,

Dr. Lizzie Daly
GROUP MANAGER STRATEGY, REGULATION AND SCIENCE

Kāpiti Coast
DISTRICT COUNCIL

11 August 2023

Ministry for the Environment and Ministry of Primary Industries
Wellington
Email: etsconsultation@mfe.govt.nz, NaturalResourcesPol@mpi.govt.nz

Feedback on the review of the New Zealand Emissions Trading Scheme and Permanent Forest Category

Tēnā koe

Thank you for the opportunity to provide feedback on the Review of the New Zealand Emissions Trading Scheme (ETS) and a Redesigned Permanent Forest Category. Our feedback focuses on both the incentives within the ETS for permanent forestry and for indigenous planting, and on the design of the permanent forest category as well. We have responded to the aspects and questions of most importance to us at this time.

Kāpiti Coast District Council is particularly conscious of the effects climate change is likely to have in escalating frequency going forward, and we have already seen the effect of increasing severe weather events on New Zealand communities this year. The effects of erosion, flooding and slash were unfortunately well demonstrated in Northland, Auckland, Waikato, Hawke's Bay, Taiwrāwhiti and Wairarapa.

Kāpiti Coast District Council's region features a wonderful coastal environment, with several steep forested areas overlooking built up areas including housing, and important roads. We are aware of the protection that some of the currently forested areas provide to our important assets and that planned deforestation may cause issues in the future.

Incentivising activities that would provide protection from, or reduce the severity of, these effects should be a consideration for the ETS incentives and permanent forest category design.

Review of the New Zealand Emissions Trading Scheme
We are supportive of the overal intent of the ETS review discussion document to increase incentives to reduce gross carbon emissions.

It is important to consider longer term aims and co-benefits as part of your process. Ultimately, the scheme will have a greater positive environmental impact if it is aiming to both reduce overall emissions and promote environment-positive choices that support long term environmental stability.

We also acknowledge importance of forestry for jobs and supporting the economy and supporting landowners to make choices that allow them to support their business and the environment. We note the comments in the discussion document regarding the disproportionate impact on Māori of settings that limit landowner's choices. We therefore support an incentive based approach to encouraging permanent, indigenous afforestation.

We support consideration of incentives that:

- Support the protection of our native biodiversity through permanent indigenous planting, and a 'right tree, right place' approach
- Support permanent carbon sink planting
- Provide additional protection to environments susceptiple to effects of climate change (populated areas, erosion-prone areas, areas projected to be susceptible to other climate events eg reducing effects of increased storm activity in vulnerable areas)
- Support permanent indigenous plantation in areas of ecological or cultural significance (eg expanding known native animal habitats, aligning with existing nearby native forest areas)
- Support combination planting, that allows for harvest activity, while also providing areas of permanent forest to provide continous protections (eg increased areas of riparian border planting).

For these reasons, we would be supportive of option 4 in the discussion document, that aims to create more tailored incentives for removal activities.

We would also support including a wider range of planting activity that supports long term carbon sequestration and positive environmental outcomes. Restoration of wetland areas, for example support the storage of carbon in soil, that would otherwise be released through agriculture and residential land use changes. This would also provide incentives for landowners to consider the appropriate indigenous planting for their site.

A Redesigned ETS Permanent Forest Category

We acknowledge the important role Greater Wellington Regional Council plays in managing compliance with the National Environmental Standard for Plantation Forestry. We have worked, and continue to work, with Greater Wellington on areas where we have concerns about specific sites, especially where they are close to built up areas.

We note that any large scale harvesting of forested areas presents an increased risk of erosion, exposure to elements and waste byproducts (ie slash). We would, therefore, encourage consideration of longer minimum timeframes for inclusion in the permanent forest category. As it stands, the settings of 50 years still allow for commercial harvesting of larger, longer growing exotic trees (such as redwood), rather than a fully permanent forest.

We would also agree with recommendations in the document that there should be additional management processes for forest types that have known higher risks (eg more prone to wilding, fires, pests) or where continued action must be taken to ensure benefits are realised (transition forests). Again, we would support a focus on incentivisation rather than punishment (and therefore loss of benefits if not following planned activity). In general, we belive the current approach to management should continue – that is it the owner's responsibility to monitor progress and have that verified by the Ministry of Primary Industries, as it is the owner who stands to benefit financially from the Scheme.

As a district council, our role in these matters can sometimes feel small in proportion to the possible consequences we may have to manage for our district if something goes wrong. We therefore greatly appreciate the opportunity to comment on the review of the ETS and the proposed redesign of the permanent forest category.

Yours sincerely

Darren Edwards
Chief Executive | Te Tumuaki Rangatira
Kāpiti Coast District Council

Janet Holborow
MAYOR, KĀPITI COAST DISTRICT

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10 August 2023

MBIE, MPI, MfE
Review of the Emissions Trading Scheme
Via email: etsconsultation@mfe.govt.nz

Lewis Tucker submission on Te Arotake Mahere Hokohoko Tukunga – Review of the Emissions Trading Scheme (ETS)

Introduction
Lewis Tucker is an agricultural advisory firm that was set up 10 years ago to help the country's agricultural sector innovate, raise capital, and invest in its future. We are passionate about what a diverse, innovative, and well-capitalised agricultural and forestry sector can deliver for our economy, our rural communities, and our climate change commitments. As part of our operations, we provide services to two rotation forestry funds that invest for both carbon and timber outcomes across ~30,000 hectares of economically marginal hill country.

Our forestry operations strive for the highest standards, only planting marginal land that is best suited to trees and undertaking subdivisions and sale of properties to ensure productive land and associated infrastructure stays in farming. We are committed to rotation forestry for timber outcomes but also currently manage ~10,000 hectares of indigenous forest in various stages of regeneration that we are supporting through concerted professional pest control.

This feedback is provided by Lewis Tucker in its role as an agricultural and forestry service provider. The individual partners in the forestry funds that Lewis Tucker serves may choose to separately provide their own specific viewpoints and perspectives on this matter.

Certainty is essential
For much of the last 12 months the policy and market settings that underpin the country's climate change response have been unnecessarily unstable. The country's climate change response has been characterised by numerous consultations, changes in direction relating to the consideration of advice from the Climate Change Commission (CCC), two unsuccessful carbon auctions and a collapse in the price of an NZU, causing an uncertain investment and planning environment.

This consultation on a fundamental review of the ETS was launched in this context and also at a time when the government was a party in court proceedings regarding procedural deficiencies when considering CCC advice on unit limits and price control settings.

The primary rationale for this consultation was stated to be a perceived failure to reduce gross emissions. However, it was launched at the end of a 15-month period of fossil fuel subsidies and at a time when other government decisions had a significant influence on halving the carbon price. The simple fact is that the price signal generated from the ETS regime (that is largely agreed to provide an incentive for decarbonisation) is being disrupted.

We have welcomed the government's announcement on 25 July, in response to the judicial review, to align its annual decision on unit limits and price control settings with advice from the CCC. We welcome the acknowledgement that this critical change in position will "drive stronger action on emission reduction targets" albeit noting the observation that a $10.00 increase per NZU will have a "minimal" impact on consumers.

The government's change in approach acknowledges that the ETS must be allowed to do its job and send the price signals for which it was designed. An increase in the price of emission units that does impact the behaviour of consumers should be seen as a necessary element of the overall regime. Now is the time to allow the ETS to work as intended, provide the certainty that participants need and remove short-term politics from the country's climate change response.

The current ETS consultation should be withdrawn

The most material and meaningful way that the government could enhance confidence in the foundations of the country's climate change response would be to withdraw this consultation.

It was generated during a period in which government approach was moving in a markedly different direction and is lacking in a clear, constructive purpose. This consultation is the remaining source of uncertainty for participants in the ETS.

Our recommended approach (to withdraw the consultation and consider viable alternative gross emission reduction strategies) will go some way to putting New Zealand on the right pathway for decarbonisation. Those entities that are pursuing responsible low emissions investments and forestry investment, which the country badly needs as New Zealand's bridge to a low carbon economy, would also be given the appropriate signals to restart their originally planned activity.

The original purpose of the ETS is for ~50 per cent of New Zealand's emissions to be paid for and carbon abatement (forestry) rewarded. The market price of carbon was to incentivise emitters to reduce their costs by either directly cutting emissions, investing in the capture of emissions or planting forests. This is working well and as it was intended.

Some of the country's larger emitters have invested significant resources in forestry as one component of an overall decarbonisation strategy. This investment commits funding over a long period; given the time it takes to establish a forest, register it within the ETS and realise the benefits of timber. Some of the emitters that have invested in forestry are conducting research with regards to how wood fibre can be utilised to reduce gross emissions. More generally, further government investment in boosting wood processing infrastructure will help the benefits of New Zealand timber to be realised.

We strongly support the government's Forestry and Wood Processing Industry Transformation Program (ITP), particularly with its focus on incentivising regional timber processing. The timber produced from rotation exotic forests will, if used appropriately, for example in buildings, prove to be an essential stepping stone to a low-carbon economy of the future.

The investment in forestry that has been made is based on an alignment of views with the Climate Change Minister:

> *"If we are to have any hope at all of playing our part in the global fight to avert a climate catastrophe, we need more forests, not fewer. We're going to need fastgrowing exotics as well as slower-growing permanent indigenous forest carbon sinks".*

Furthermore, the investment, particularly in forestry, that has been made to date is based on clear signalling by the government as to how it wished for participants to address the challenge of meeting climate targets. It is essential that such investment yields the benefit for which it was intended and that future policy honours the recognition of such benefits that have been delivered by significant private investment.

Simply put, forestry as part of the ETS needs to stay where it is. Other policy settings need to be amended to ensure that forests are established on the right land, managed throughout their lives and forest owners are rewarded appropriately for the environmental benefits they provide.

Reassure investors, invest in decarbonisation initiatives, let the market operate
We urge the government to exercise the greatest possible caution in ensuring investors are rewarded for committing their resources to address climate change. Every opportunity must now be taken to reverse the loss of confidence that has been experienced over the last eight months and the best way to do this is to end this consultation.

We support policy intervention to actively encourage (and for the government to co-invest) in decarbonisation. We also support additional policy such as the UK's 100 per cent tax deducations for corporate investment in a wide range of decarbonisation initiatives.

From what we observe, large emitters are actively engaged in projects that reduce their gross emissions. Some of these projects are in the process of construction and delivery but are at risk from regulatory uncertainty. The best way to support these projects is stable climate change response settings including a genuinely market-based carbon price.

Conclusion: a one-off chance to restore confidence, get climate change response back on track
Post its 25 July commitment to the CCC advice, the government has a unique opportunity to restore confidence by withdrawing this consultation, leaving intact the fundamentals of the ETS and forestry's role within it.

Failure to do so will prolong the uncertainty for an extended period of time given that no meaningful decisions will be made until 2024 and this will continue to erode the confidence of those contributors to the required outcomes that have committed capital in good faith to deliver on the government's previously stated objectives.

The ETS is the country's foundation market mechanism to price carbon. It must be able to operate with integrity outside of short-term political objectives.

As always, we are very happy to discuss any element of this submission directly and at any time.

Thank you for the opportunity to make these comments.

Colin Jacobs
Executive Director
Lewis Tucker and Co

Office of the
Māori Climate Commissioner
mata māori, āhuarangi ora

Māori Climate Commission Submission on:

ETS REVIEW

AUGUST 24 2023

Representatives of The Māori Climate Commission attended an ETS Review consultation with Māori at Scion where Māori unanimously rejected all four options proposed and called for an immediate cessation of the ETS Process. The Māori in the room were by and large, foresters and forestry experts with life long experience in forestry and will responsibility for tens of thousands of hectares of forests.

SUMMARY

The Māori Climate Commission wholly rejects the proposals contained in the ETS consultation document, on the following basis:

- This proposal has been formed without hearing our voice through participation in the co-design agreed by Ministers Nash and Shaw in 2022; it lacks clear supporting evidence and a proper cost benefit analysis. Māori participation has been a tick the box exercise that makes a mockery of the agreed process of co design and of the Te Tiriti obligations as enshrined in the Emissions Reductions Plan.
- If implemented this will deny Māori the opportunity to plant forests on what is left of their lands and take advantage of the once in a generation opportunity to participate in the carbon economy for the intergenerational benefit of Hapū and Iwi. What is offered to Māori instead is ***uncosted welfare ! This is brutal, unmitigated racism.***
- We object to the recycling of the lie of "too many trees" that underpin this consultation paper.
- It is **brutal, inequitable and racist.** How is it that Māori will be punished for wanting to sequester carbon and generate wealth on our land, while in turn Pakeha farmers are allowed to increase their pollution and be subsidised to do it.
- The result would limit domestic sequestration and would increase the amount of carbon in the atmosphere during this climate emergency. Knowing that some businesses will go broke and that others will simply pass on the costs of reducing their emissions to households could only be contemplated by politicians playing to the voters and officials insulated by high salaries and whiteness.
- It is a typical Pakeha solution. Instead of having forestry carbon offsets as well as limiting emissions giving emitters time to reduce emissions and avoiding huge costs being passed on to households leading to inevitable reactions in the streets as we have seen in France, we

are given a narrow, govt takes all where the markets, investors and landowners are shoved to the back.

Shame on officials who have gone along with this cynical ploy to win the Greens votes. Who have knowingly included false information – such as the lie of oversupply of trees, who have mustered a fake co design and consultation process. Māori have been thrown under the bus by this ETS review and by the way officials have trampled the mana of Te Tiriti o Waitangi, misleading Cabinet that a process of involvement was planned, yet in 6 months of writing this document, not implementing what they promised in the Cabinet paper on the permanent forest category which states

> "Both the Crown and Māori have positive duty to act in good faith, fairly, reasonably and honourably towards each other. The duty of good faith includes a requirement that the Crown take reasonable steps to make informed decisions on matters that affect Māori interests … The Crown is also mindful of the commitments made in the Emissions Reduction Plan **to partner with Māori in developing forestry policies that support Māori aspirations, and their exercise of kaitiakitanga and rangatiratanga**."

Consultation Flawed

- This ETS Review is not about ETS or forestry, rather it seeks radical transformation of NZ's climate action and NZ economy by placing the govt in control of:
- Rate that emitters reduce their emissions and transform their business to do so
- Cost that households and business experience from climate action
- Fate of businesses ie new opportunities pursued, close down of existing businesses
- Unit availability and potentially overseas income from units

Key elements of options set out

All options seek to increase Govt control as the driver of the market outcomes.

- Reduce forestry units
- Starve emitters of units
- Force emitter reductions – price or tax
- Welfare to mitigate impact of cost pass through- cost increases acknowledged
- Govt funder of new initiatives and investments

Risks

- The approach being taken the ETS Review document will Impact the whole economy – but because there has not been any General equilibrium modelling we can't quantify those impacts.
- There will be severe Impact on investor confidence – in fact that has already happened
- The Impact will be that sector and regional community businesses will be force to shut down
- Carbon units will need to be bought offshore and so social funding will be impacted leading to disproportionate impacts of Māori

- Māori who already hold carbon credits and have significant forestry interests and investment will be directly impacted – the document does not address this issues.
- Failure= only option international credit purchase, with an amount already identified and this will greatly increase what is needed

Māori Climate Commission Response

- This won't be the first time the Crown has confiscated existing value from Māori . This ii will do if it controls all low carbon transition at the cost of market participants
- The document does not make a case for ETS failure or for the intention of taking control of the ETS market. That is, the analysis provided in the ETS Review document does not prove in any way that the status quo will lead to failure and that this proposed action will leave us in anyway better off in terms of climate, economy or socially.
- The ETS Review fails to provide the impacts of any of the proposed changes on the economy, on various sectors, on Māori , on communities and households. Where is the cost benefit analysis plus social equity evaluation.
- The ETS Review states that the proposed actions will devastate industries, increase costs to household and business, impact gas supply and likely close down businesses impacting jobs but have not provided any analysis to quantify these claims.
- The Review document seeks to restrict forestry and control unit supply without consideration of the impact both for climate, future industry/growth – biofuels, wood products, investor and business response. There is no detail on existing forestry impact or Māori carbon economy aspirations – which is a pretty careless attitude for the officials who put this together to take.
- The document seeks to remove the opportunity for Māori to be a participant in their own carbon economy and instead propose to replace it with ***uncosted and lack of detailed initiatives*** support and ***welfare instead.*** This is not what Māori want. We do not want welfare – we want to stand on our own two feet and use our own assets to generate wealth.
- Consultation problems
    - lacks breadth of options other than govt control and change of ETS
    - makes erroneous assumptions
    - restates and recycles known wrong facts to support its claims
    - lacks modelling rigor of impacts, cost and benefits- this has either not been done or is not being shown to us
    - fails to recognise and address non price barriers
    - Does not put forward an option for other than Govt control and lead actor
- So, the case has not been made to take action
    - we cannot evaluate what is provided due to lack of detail

- Needs to be withdrawn and reworked and fully costed,

What is needed to make the case

- We call for a new process where the Govt goes out and understands the barriers to emissions reduction on a sector basis, sets out a plan phasing in emission reduction actions as it cannot all happen at once, sets out sector plans and then also provides full modelling of the impacts.
- There needs to be a supporting model for the proposals that are made which are fully shared.
    - everything must be transparent to be evaluated by all.
    - There needs to be a range of options that are fully modelled and costed from business Investor led, to status quo trough to govt led
    - Need to also identify who are the natural owners of leading and delivering innovation e.g. blue carbon = Māori, social = science led, methane =farming led

Stop undermining Māori access to the carbon economy

The Government says "To meet New Zealand's 2050 climate change targets, the Ministry for Primary Industries (MPI) projects that an increase in afforestation of between 0.74 million and 1.46 million hectares of new forest will be required." Yet it is determined to throw obstacles in the path of Māori landowners seeking to plant those trees and help Aotearoa achieve those targets.

Māori have been very clearly advising for some time our desire to enter the carbon economy. We want to do our part to restore the health of Ranginui and Papatuanuku, damaged by reckless colonialism and expansionism. We want to finally be able to generate jobs for our people and intergenerational wealth on the scraps of our land that colonisation has left us. We have acted in good faith based on that understanding. Now, we find the Crown, once again, acting in bad faith towards us.

Being able to establish transition forests within the permanent forest category would create jobs in planting, trimming, the bioenergy sector, pest control, and more. It provides a pathway for us to restore the native state of our land along with matauranga Māori principles. The carbon we would sequester would generate wealth for our people as we transition from exotic species to a native forest and the funds to invest in new opportunities, such as low carbon infrastructure.

We do not understand why the Crown now thinks it can again rip that away from us after the work we put in to create the permanent forest category in the ETS.

We were finally heard on exotics remaining in the permanent forestry category. However, we have not yet caught our breath and there has been a succession of policy proposals emerge from government agencies that propose to take that decision away without any effort made by the agencies towards co-design with our forestry experts.

It should be clear that this disrespects mana whenua and their rangatiratanga over their rohe, and the expropriation of their wealth is a breach of Te Tiriti.

Don't continue to propose policy based on myths

The consultation document presents no evidence of a real problem of any scale caused by afforestation. Instead it points to "concerns" from unnamed groups and unquantified, unevidenced

"risks". It seems Crown officials have again accepted and repeated the baseless claims of extremist Pakeha groups like Groundswell and 50 Shades of Green. This is just merely a recycling of the conversation put forward regarding exotic inclusion and a repeat of the myths that support an argument to restrict planting on what would result in less than 5% of all land being planted.

Where is the evidence of large scale afforestation of prime farmland? Where is the evidence of communities destroyed by afforestation? Where is the evidence that afforestation is cutting agricultural output or reducing the number of rural jobs?

We have been asking these questions now for nearly 5 years. There simply isn't any evidence. Officials who continue to repeat and recycle these myths are knowingly misleading Ministers and the community.

There is no threat to farmland or rural employment – in fact, agricultural employment has risen in the last 20 years, even as marginal land has been converted to forestry.

MPI estimates only 3% of farmland will be converted to forest over this decade. That will overwhelmingly be marginal land that is, in truth, often unprofitable as farmland. Transitional, managed forestry on this land is more jobs intensive and more productive, leading to more wealth in our rural communities, than low productivity farming.

The fact that this discussion paper has swallowed whole the myths from Pakeha extremist groups like Groundswell and 50 Shades of Green shows just how racist this paper is. Groundswell and 50 shades have a history of anti-Māori statements and official are colluding with them in dictating to Māori land owners what they can do with their land.

We are not going to turn every farm into forest. We are going to re-establish forest on marginal pieces of low quality land – the only land the Crown didn't take from us. There will still be plenty of land for farming, which is allowed to pollute the climate for free, and if farmers choose to sell their land or convert it to farming that is their choice to make without lobby groups trying to dictate to them.

We have asked and the Crown has agreed to discuss these myths and form a joint fact based view. Yet since July 2022, our technicians have been ready and the Crown in turn has stalled and swerved from any engagement, yet alone having the agreed hui to dispel these mythical issues. And this ETS Review is the result.

More work needed to understand the true costs of putting barriers in the way of afforestation?

Deeply concerning is that the Crown seems oblivious to what it is proposing to do; both in terms of acting against Te Tiriti and imposing the climate costs on Aotearoa now and on our future generations.

There is no analysis of the climate impact. How can it be that, during the climate emergency, the Crown is proposing policy changes to reduce forest planting and it hasn't even calculated what the impact on emissions would be? It is obvious that reducing forest sequestration would make it harder to reach the country's emissions goals, mortgage the country's future wealth and make Aotearoa liable to buying more credits from overseas – if they are even available.

It is imperative when making decisions that will affect the level of afforestation to know how much the amount of forest will change as a result, what impact that will have on net emissions and our NDC, and the cost that creates.

The proposal is based on the premise that there will be "too many trees" based on a survey that officials have admitted is flawed yet which they continue to use to justify their false claim. Where is the good faith in presenting lies and obfuscation as fact.

But let us remember what "too many trees" means – it would mean our forests are sucking hundreds of mega tonnes of carbon out of the air. That's a good thing! The Crown should not be trying to stop it.

Don't adopt a policy to increase net emissions in the middle of the climate crisis – how can there be such a thing as "too much" sequestration when our planet is burning?

Unfair treatment of Māori foresters compared to Pakeha farmers

We must compare the treatment of predominantly Pakeha farmers with the treatment of Māori forest owners. Farmers were given five years to develop their own plan. Not only is this incredibly generous in a climate emergency but the outcome arrived at is that farmers will be allowed to continue to increase their emissions, with just 5% of biogenic emissions facing a levy, and that money going straight back into paying farmers to decarbonise.

On the other hand, Māori landowners, who are responding to the Emissions Trading Scheme and backing the Emissions Reduction Plan, are told that their planting plans are wrong, that they will sequester "too much" carbon and lower Aotearoa's net emissions "too much", resulting in a lower carbon price – an fact-free and ridiculous proposition – and barriers will have to be put up to stop that.

In essence, the Crown will incentivise Pakeha farmers and allow them to continue polluting, but Māori landowners who want to earn their own way and help counter climate pollution are targeted with proposals designed to stop us in our tracks.

Under the permanent forestry category review, Māori landowners were told they must go cap in hand to councils for permission to sequester carbon, while farmers are allowed to continue to increase their emissions as much as they want. Would the Crown propose a system where Pakeha farmers had to come to Māori foresters for permission to increase their herds? It's unimaginable. No government would even contemplate such an idea. And yet that is the position that the government proposes to put Māori foresters in.

This flawed proposal, based on myths, must be abandoned

It is hard to fathom how, in 2023, after:

- The adoption and ratification of the Paris Accord by Aotearoa
- The passing of the Zero Carbon and Climate Chance Amendment Acts
- The establishment of the Climate Change Commission and publication of the first budgets
- The creation of the permanent forestry category, with the inclusion of exotic forests

This proposal if implemented would increase Aotearoa's emissions

If the Crown wants to achieve its NDC Paris Commitments at home and truly values Māori investing in returning their land to natural state and allowing Māori to flourish in the carbon economy, it must not trying to chop our knees off.

The Crown now needs to work hard to rebuild trust and restore momentum to Māori forestry plans. The Crown must act as a partner and embrace co-design. Ministers Shaw has failed to honour an agreement to set up a technical working group nominated by Māori foresters and by the Crown to work through a series of outrageous and untrue myths propagated by farming extremists and now used as a basis for documents such as this one under discussion.

The Crown must not engage in these high-handed actions, where it suddenly drops bombshells that will change the rules on Māori mid-stream and take away our access to the carbon economy. There must be genuine conversation between partners based on Te Tiriti.

Any policy that limits the rights of Māori to decide what they do with their land must be co-designed with Māori in accordance with Te Tiriti.

We are beset by the nonsense argument that the Greens and the pakeha conservation movement are making that the permanent category should only be natives. However, these people have probably never praised natives in a nursery of planted natives to know how uneconomic this argument is.

This is our land, what little of it is left in our hands, and this ETS Review written by wall to wall Pakeha bureaucrats, and a Minister hell bent on putting on a show for the voting public. The result is an ETS document with numerous wrong assumptions, at least one big lie (oversupply of trees) and driven by those who have no responsibility of care for the wellbeing of Māori.

MĀORI CLIMATE COMMISSION RESPONSE TO CONSULTATION QUESTIONS – TE AROTAKE MAHERE HOKOHOKO TUKUNGA, REVIEW OF THE NEW ZEALAND EMISSIONS TRADING SCHEME

Question 2.1: Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

87. No. This assessment has been developed to gain support for, and to fulfill, a political agenda for changes to Aotearoa's approach to climate change action. Specifically, it seeks to shift from net emission to prioritising gross emissions. While perhaps well-intentioned, this revised approach does not have any mandate from Parliament and is contrary to what it set out in the current legislation. More broadly, it has not been consulted on or endorsed by political parties, Māori, key stakeholders and the public. This can be contrasted from the focus on net emissions, which is captured by the current legislation, and which was broadly consulted on and endorsed when that legislation was passed.

88. It is important to keep in mind that while decreasing emissions is an valuable goal, it must be considered alongside other factors such as the costs to households and businesses (particularly in lower socioeconomic groups), and long-term planning and investment that has been made on the basis of the current legislation.

89. Furthermore, the central key stated problem is purported oversupply is a fallacy that relies on incorrect and unreasonable assumptions. We, and others, have identified a number of

manipulated assumptions and significant errors in the modelling that underlies this problem identification (as set out above). Put simply, the conclusions set out in this chapter are not valid or supported by evidence.

Question 2.2: Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

90. After nearly a decade of political wrangling and mixed signals from officials (and particularly) since the removal weakening measures such as 2-for-1 and the implementation of a clear trajectory and plan to 2050), the ETS has been working well and as intended. NZU prices have been trending upwards, and as a consequence these increasing costs were supporting increased low carbon investment and actions by emitters in terms of gross emissions reductions.

91. Unfortunately, through this current consultation and the Government's actions over the last year, the ETS and NZU market has moved from being strong and stable, to uncertain and unstable. In doing so, the Government has wiped millions of dollars from existing investments, including Māori trusts with forestry assets. This has had a chilling impact on the availability of capital for private low carbon investment, particularly for Māori investment.

92. This is all the more disappointing given that it is in stark contrast to the stability of Aotearoa's regulatory approach over the last few years. Following, the passing of the Zero Carbon Act with cross party support, and the establishment of the carbon budgets, emitters were given clear signals about taking reduction and mitigation actions. Further, there was confidence to invest and believe there will be a cohesive regulatory environment, regardless of who was in Government.

93. This stability is absolutely necessary for the ETS to be effective, given that it requires long-term planning decision. Clear and consistent signaling of expected intent is also essential for greater emitter climate actions and investment. But it is important to realise that this investment is not just based on NZU prices and regulatory certainty. Rather, there are other barriers to emission reductions being implemented such as access to capital or technology, depreciation policies, and sector specific commercial and legislative barriers. There needs to be a much better understanding of these barriers, their costs to overcome, and the forecast timings and mitigation actions needed to deliver these changes.

Question 2.3: Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?

94. The Māori Climate Commission has led the representation of Māori interests in the ETS and forestry policy, because we recognise the substantial interest Māori have in these areas. Half of whenua Māori is in forestry. In 2018, Māori were estimated to own $4.3 billion of forestry assets, and about 45% of commercial forests land in Aotearoa. Māori often own marginal land in Aotearoa best suited to forestry. Further, beyond landholdings, Māori own more $100 million of NZUs.

95. This consultation has cost Māori approximately $11.2 billion already (as detailed above). It is also risking the potential future value of $15 billion that could be realized by allowing Māori to properly participate in the carbon economy.

96. Right now, it is difficult to attract investment capital for afforestation, because this consultation and Government actions more broadly have caused havoc for market confidence.

If this consultation is withdrawn and we design a long term and stable system that works for everyone, then stability can be brought to the market and the necessary forest investment will return over time. This is how true and lasting value can be realized.

97. The risks and issues raised regarding exotic forests have been previously negated and accepted as such, and the Government modelling forecasts of decades of record planting will never happen. If sensible ETS settings are agreed, then sensible levels of vital forest investment will occur.

Question 2.4: Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

98. No, we strongly disagree.

99. It is entirely unclear why the Government is again initiating a review seeking to limit or restrict exotic species, either from the ETS or permanent forest category. The risks and issues raised have been previously negated and accepted as such by the former Minister of Forestry. The reasons underlying this are set out in detail in The Māori Climate Commission's extended report and technical analysis on the matter.[1]

Question 3.1: Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

100. No, we strongly disagree. It is not an 'either or'. Rather, <u>both</u> net and gross emissions reductions must captured.

101. We are in a 'climate emergency and it is not the time to pick winners based on ethos or politics.

102. More work is needed on understanding the barriers to gross emission reductions, including the cost/benefit of different actions, technological gaps and capital/ depreciation models. In line with original development, any changes to the current targets need (from a practical and indeed a legal perspective) societal buy-in and a full legislative consultation process. But also, net removals must also be enabled.

103. Given the importance of this mahi to Māori and the world view and assets managed by our people that could assist Aotearoa meet its objectives, we seek, a te Tiriti-compliant development process to inform and manage action going forward.

Question 3.2: Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

104. No, we strongly disagree. Māori will not allow the costs of scarcity to be imposed disproportionally on our people.

105. The reforms propose to constrain net emissions in order to force, through scarcity, gross emissions reductions by 2030. Identified from this approach is that businesses will close, jobs will be lost, and the poorest (and in particular Māori) will be disproportionally impacted. Importantly, while these consequences are broadly alluded to, none of this is modelled or

[1] The Māori Climate Commission, 'Toitū te whenua Toitū ngā hua o Tāne – sustain our lands, sustain the bounty of our forests' (March 2023).

costed. Fuel and electricity shortages are also noted as a consequence of this proposal, but notably are also not costed.

106. Proper assessment of the significant impacts of this proposal is needed. Aa plan must be developed that is fair and does not impact the most impoverished. Suggesting that the poorest should simply 'take it' is entirely unacceptable.

Question 3.3: How important do you think it is that we maintain incentives for removals? Why?

107. It is vitally important that there are incentives for removals, and that forest investment is supported.

108. See the answer to question 2.3 above. The Government is (or plainly should be) aware that forestry in the ETS is a once-in-a-generation opportunity for our people. In addition to the harm that has already been done by the Government through this review, the current proposals remove this opportunity and, as a consequence, the billions of dollars of additional value to the Māori economy.

109. The Māori Climate Commission will not support the Government unilaterally pursuing its proposals and removing this opportunity for our people. If necessary, The Māori Climate Commission will continue to fight these various matters in its existing Waitangi Tribunal claim, and further before the High Court and the United Nations. Its rights are reserved in full.

Question 4.1: Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

110. No, we strongly disagree. The description shows a total lack of understanding of Māori and the objectives of our people.

111. We have explained our interest in the ETS for many years to successive Ministers and to endless government officials. We have prepared and provided detailed submissions, reports and analyses. Despite this, the Government and its officials produce proposals which seek to further impoverish Māori and confiscate the opportunities and value we can attain from our lands. More egregious, the Government proposes putting our various interests and assets under its control.

112. We need to work together in true partnership and good faith (as required by te Tiriti and the relevant legislation) to develop policies and solutions. Anything less than partnership will mean that the Crown has failed to make informed decisions on matters affecting the rights and interests of Māori and failed to design policy proposals that adequately protect their tino rangatiratanga over their whenua, resources, and people. This is a legal requirement set out by the Waitangi Tribunal and s 3A of the Climate Change Response Act 2002.

Question 4.2: What other interests do you think are important? What has been missed?

113. The Government and its officials have completely failed Māori in the development of this proposal. Specifically, they have failed to work with us, failed honour the requirements of te Tiriti, failed to honour the commitments you have made, failed to enable us to independently build our own wealth and to assess and inform our people of the impacts of your proposals.

114. Put simply, 'what has been missed' is that the Government and its officials need to run a te Tiriti-compliant process. We need to work together in true partnership to develop policies and solutions.

Question 4.3: How should these interests be balanced against one another or prioritised, or both?

115. It is for Māori to decide what is right for Māori. The consultation documents superficially recognise that any changes to the ETS will prejudice Māori significantly in exercising their tino rangatiratanga over their land forestry. Our membership, and other Māori, will not cede control of our lands or allow the Government to take value from our lands. Any attempt to do so would be akin to the foreshore and seabed issue.

Question 4.4: What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

116. There are undoubtedly massive opportunities, as set out in detail above. We have identified $15 billion of potential returns on through our participation in the carbon economy. This is returns that our people can gain for themselves, particularly given that large portions of their land is marginal land and only suitable for forestry.

117. Sadly however, the current proposals would remove this once-in-a-generation opportunity in favour of the Crown taking control of what we can do on our lands and the returns we might otherwise realise.

Question 5.1: Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

118. No, we strongly disagree.

119. There is no legislative mandate to do so. Our NDC and zero carbon targets are based on net emissions, not gross emissions. The net target was widely consulted on and had wide political consensus (with the exception of the ACT party's single MP).

120. While net as opposed to gross may seem like a simple issue, it is much more complex than the consultation documents suggest. In particular, the balance between net and gross must be viewed alongside detailed costings to ensure that the costs imposed on households and businesses are acceptable.

121. We are in a climate emergency and now is not the time to pick winners based on ethos and politics. The truth is that both net and gross emissions reductions must captured. As matters stand, more work is needed on initiatives to reduce gross reduction barriers. In line with original development, any changes to the targets need societal buy-in and a full legislative consultation process. A te Tiriti-compliant process must be used to inform and manage any changes.

Question 5.2: Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

122. We support a plan developed in partnership with Māori that creates aligned action by all stakeholders, encourages forestry, and delivers transition in a cost-effective way.

123. The reforms propose to constrain net emissions in order to force, through scarcity, gross emissions reductions by 2030. The consultation documents identify that under this approach businesses will close; jobs will be lost and the poorest (including Māori) will be disproportionally impacted. While these concerns are noted, they are not properly costed, so the extent of them is unknown. Fuel and electricity shortages are also noted but not costed.

124. Māori cannot afford for the economic and social costs of scarcity to be imposed on our people, particularly in circumstances where the Government does not know the extent of those costs.

Question 5.3: Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

125. Yes. The importance and benefits of forestry and forestry removals to helping meet Aotearoa's climate change goals have been well established. In fact, according to Climate Tracker, this is the only area where our actions are seen as sufficient to meet the challenge posed by climate change.

126. While forestry is noted as the cheapest mitigation option and required, it is clear that the Government's current proposals seek to limit and/or control afforestation. All options lower domestic afforestation and will accordingly lead to an increase of overseas unit importation. Further, all options remove the once-in-a-generation opportunity for Māori to participate in the carbon economy and gain full value from these actions.

127. We need to work together in true partnership and good faith to develop policies and solutions.

Question 5.4: Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

128. No, we strongly disagree. The ETS review as proposed does not have merit.

129. We strongly submit that all work on this flawed review and its proposals must stop. Instead, in the new term of government we must start again as partners and work through a plan and actions that delivers the best course and speed for Aotearoa.

Question 5.5: Are there any additional criteria or considerations that should be taken into account?

130. See the answer to question 5.4 above.

Question 6.1: Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

131. We do not support this primary objective as there is no mandate to move from a net emissions focus to prioritise gross emissions. This mandate is essential, both legally and practically.

132. As set out above, regarding this consultation, none of the options have merit. All options result in lower gross emissions. Options 3 and 4 result in unchanged net emissions. That is, they do not help us towards our Paris Commitment or domestic our zero carbon targets.

133. All options come at great cost to households. This cost is noted as disproportionate in its impact, skewed towards the lower socio-economic households. Māori are disproportionally impacted in terms of socio-economic status.

134. All options lower domestic afforestation and as such result in a likely increase of overseas unit importation. Further, all options remove the once-in-a-generation opportunity for Māori to participate in the carbon economy and gain full value from these actions.

135. See the answer to question 5.4 above.

Question 6.2: Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

136. No, we strongly disagree. See the answer to questions 5.4 and 6.1 above.

Question 6.3: Of the four options proposed, which one do you prefer? Why?

137. We do not support any of the options and call on the Government to begin again in partnership with Māori. See the answer to question 6.1 above.

Question 6.4: Are there any additional options that you believe the review should consider? Why?

138. Put simply, the ETS review as proposed does not have merit. See the answer to question 5.4 above.

Question 6.5: Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

139. We do not support any of the options and call on the Government to begin again in partnership with Māori, this work needs to begin again jointly identifying objections, options and impacts.

Question 6.6: Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

140. No, we strongly disagree. See the answer to questions 5.4 and 6.1 above.

Question 7.1: Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

141. The final pages of the document look to reward other forms of carbon removal and providing incentives for co- benefits. No numbers are provided, and details are sketchy at best. Having said that, it appears this would be a state-run process presumably planned to be funded by the arbitrage stolen from Māori landowners and other foresters investing in planting under the proposed nationalisation system, if any planting occurs.

142. The Government is not the natural owners of these initiatives. We observe that no consideration is being given to high level of current Māori, farming and forestry private investment in co-benefits.

143. We also note that the most likely next carbon removal that will be recognised by the UNFCCC is blue carbon. This is a methodology which, given the rights of Māori under te Tiriti, is best placed to be developed by Māori for their own benefit.

144. Finally, the co-benefit proposals, while maybe laudable in terms of advancing environmental projects, provides no return to NDC in terms of climate action. Māori will not accept payment through arbitrage of these state run environmental projects.

Question 7.2: If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

145. See the answer to question 7.1 above.

Question 7.3: Should a wider range of removals be included in the NZ ETS? Why/Why not?

146. See the answer to question 7.1 above.

Question 7.4: What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

147. See the answer to question 7.1 above.

THE MĀORI CLIMATE COMMISSION'S RESPONSE TO CONSULTATION QUESTIONS - A REDESIGNED PERMANENT FORESTRY CATEGORY

Question 1: How do you think the Inquiry's recommendations could be reflected in proposals to redesign the permanent forest category?

148. It is entirely unclear why the Inquiry's findings are being, or might be, reflected in any permanent category redesign. The Inquiry focused on another forestry land use – rotational forestry. Permanent forestry was out of scope.

149. Importantly, the Inquiry was concerned about the byproduct of rotational forestry harvest, slash. These concerns have no relevance to permanent forestry.

150. Given this, it would be grossly unfair to deny, through scope, permanent forestry stakeholder input into the Inquiry, and to then utilise these findings in the permanent forestry category without full consultation with impacted stakeholders. Any attempt to act in this way is likely to give rise to a procedural fairness ground of judicial review.

151. The Māori Climate Commission wants the redesigned permanent forest category to achieve multiple outcomes.

Question 2: Do you agree with our assessment criteria for the redesigned permanent forest category? If not, what would you change and why?

152. The Māori Climate Commission does not agree with the assessment criteria because it does not support further review or redesign of the permanent forest category.

153. Put simply, there is no basis for the redesigned permanent forest category to still be under review. Officials are aware of our previous discussions and our technical material, which was accepted by the then Minister of Forestry.[2] Despite the amount of effort and expertise that went into the report we produced, our work is clearly being undervalued. Instead, this current proposal has been produced without proper consultation or consideration.

154. The Māori Climate Commission strongly submit that all work must cease on the flawed permanent forestry category proposals. In the new term of government, we should start again as partners and work through a plan and actions that deliver the best course and speed for Aotearoa.

Question 3: Do you think any of these criteria are more important than the others? If so, which criteria and why?

155. This is not applicable on the basis that no assessment should be made relative to these criteria'.

Design Choice 1: Which forests should be allowed into the permanent forest category?

156. The status quo should continue.

[2] The Māori Climate Commission, 'Toitū te whenua Toitū ngā hua o Tāne – sustain our lands, sustain the bounty of our forests' (March 2023).

Question 4: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? Note, options 1.2a and 1.2b are not mutually exclusive.

157. The Māori Climate Commission supports the status quo. It does not support any of the options outlined.

158. It is entirely unclear why this review is seeking to restrict other exotic species from the category. We do not support any such restriction.

159. Māori have long advocated for transition forestry to be accepted by the Government as a sensible solution. It is pleasing to see that this is being properly heard and recognised. Transition forestry provides a unique opportunity for Māori to properly recognise the value of their land and to participate in the carbon economy.

160. If a te Tiriti-based approach is used in design of all ETS and forestry policy options, Māori do not need the proposed option focused only on Māori land.

Question 5: If you support allowing exotic species under limited circumstances, how do you think your preferred 'limited circumstance' should be defined? For example, if you support allowing long-lived exotics to register, how do you think we should define 'long-lived'?

161. We the support the status quo, and do not support any limitation along these lines.

162. We note further that permanent forests support the delivery of environmental benefits and climate change adaptation and resilience, including through afforesting erosion-prone land. Much of this is realised by private funding, rather than a reliance on state-funded grants and incentives.

Question 6: Do you think there is an opportunity to use permanent forests to stabilise erosion-prone land?

163. Permanent forests stabilise erosion-prone land already. They could also help address, through active management, the issue of wilding pines.

Question 7: Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?

164. No, we support the status quo with no restrictions. The wilding issue is addressed through active management.

Design Choice 2: How should transition forests be managed to ensure they transition and reduce the financial risks to participants?

165. Transition forestry requires active management by the landowner. This is site specific and requires investment in matters such as predator management, protection of seed sources, and bio-diversity. Participants undertaking this methodology do not need the regime interference or purported risk reduction measures that are being proposed in this consultation.

Question 8: Do you agree with the proposal for a specific carbon accounting method for transition forests? If you disagree could you please provide the reasons why?

166. The Māori Climate Commission does not support any proposals to change the carbon accounting, and sees no basis on which to suggest changes.

167. Importantly (and as set out above), the transition forestry illustrative curve of carbon units earned in the consultation material is neither valid nor representative of transition forestry practice. A more accurate representation is set out above at paragraph [80].

168. The Māori Climate Commission seeks to retain carbon accounting as the best methodology for this practice.

If there are other options you think we should consider please list them.

169. This is not applicable on the basis that the status quo is the optimal approach.

Question 9: If you agree with the proposal for a specific carbon accounting method for transition forests, what do you think it needs to achieve?

170. We do not agree with the proposal. Carbon stock change accounting achieves accuracy and can be applied to any forest and any management regime. Forest owners must receive one NZU for every one tonne of CO_2 stored.

Question 10: What do you think should occur if a forest does not transition from a predominately exotic to indigenous forest within 50 years?

171. This question is flawed. There is no basis for setting a 50-year timeframe. The permanent forest category does not do so. Any given forest might plan to transition the forest over a longer or a shorter period.

172. A better question is, what should occur if a forest does not transition in accordance with its own plan. The answer to that question is that the ETS already contains relevant enforcement mechanisms, including penalties, fines, offences, and the personal liability of management. These measures are sufficient.

Question 11: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? Note, options 3.2 and 3.3 are not mutually exclusive.

173. For the reasons set out, Māori are entitled to manage their own land and assets. The Government should not interfere with this.

Question 12: If there were to be additional management requirements for transition forests, what do you think they should be for? Why?

174. See the answer to question 11 above.

Question 13: Do you think transition forests should be required to meet specific timebound milestones to demonstrate they are on a pathway to successful transition?

175. See the answers to question 10 and 11 above.

176. Forest management is property specific and cannot be subject to specific milestones which will only add administrative cost and risk.

11 August 2023

Ministry for the Environment
By email: etsconsultation@mfe.govt.nz

Submission on Review of the New Zealand Emissions Trading Scheme

Submitter
Matariki Forests (Matariki) is a New Zealand incorporated company and is the third largest forest owner in New Zealand. Matariki is managed by Rayonier New Zealand Limited (RNZ), a 100% owned subsidiary of Rayonier Inc, which has been a substantial forest owner in New Zealand since 1992. Matariki is a joint venture ultimately owned by Rayonier Inc (77%) and Phaunos Timber Ltd (managed by Stafford Capital Partners) (23%).

Matariki owns approximately 120,000 hectares of commercial forests through different forms of land tenure in various regions of New Zealand. RNZ directly employs approximately 100 permanent staff and indirectly employs over 600 contractors to undertake silvicultural, forest engineering, harvesting and log cartage operations across New Zealand on behalf of Matariki. Over the last three years Matariki has invested in excess of $200 million per annum in the operation of its business.

Of the approximately 120,000 hectares of forests under ownership, approximately 8,500 hectares are post-1989 forest and are registered in the New Zealand Emissions Trading Scheme (ETS). All of Matariki Forests' post-1989 forests are registered under the Stock Change accounting regime.

As such, Matariki Forests is a participant in the ETS and has a strong interest in ensuring that the functioning of the ETS delivers both short and long-term net carbon reduction outcomes in support of NZs commitments.

Incomplete analysis and assumptions around future levels of afforestation
Widespread changes to the ETS are being proposed on the basis of inadequate and incomplete analysis and questionable underlying assumptions about future supply of forestry NZUs.

The document acknowledges some of the limitations of the options analysis, specifically that it is not possible to predict with certainty how the market will respond to policy changes. We have concerns that there is limited transparency in the modelling of afforestation that supposedly leads to the oversupply of forestry units and resultant erosion in price beyond 2030.

There is no evidence yet that the level of afforestation prescribed by the Climate Change Commission have been exceeded. Current levels of afforestation are likely to have peaked given supply chain constraints, particularly of planting stock and labour.

Further constraints are also emerging. Signals from government point to further restrictions on exotic forests in the Permanent Forests category. Both major political parties have announced policy which will further constrain afforestation.

- Labour – Changes to the NES-PF to allow delegation of land use decisions to local councils.
- National – Propose banning foreign investment participation in ETS arising from farm to forest conversion, 3 year moratorium on whole farm conversions of LUC 1-5. Annual limit of

15,000 ha of LUC 6 whole farm conversions.

Effect of options presented

All options presented have potential to change the basis of investment for forest owners. Given current levels of uncertainty around the ETS, investor confidence has diminished and planned 2024 plantings, based on discussions with several forest management companies, are significantly lower than the current year.

Recent government announcement and policy including the imposition of ETS costs, disregard of Climate Change Commission advice, and the commencement of this review of the ETS has diminished forest owner and ETS participant confidence and has placed the integrity of the ETS at risk.

The document refers to the importance of a *"strong and stable ETS price signal*" and changes proposed are in response to the contention that there may be an oversupply of units in the 2030's leading to a potential reduction in NZU pricing. It is ironic then that, a combination of government announcements and reviews has delivered a collapse in price, not (potentially) in 2035 but immediately. This has been evidenced by the market price plummeting from a high of $88.50 in November 2022 to a low of $38 reached in July 2023.

These outcomes cut across the articulated climate change goals of the government, will not encourage businesses to make low-emission investments and cast doubt over the integrity of the New Zealand ETS.

A lack of understanding of the significant and material differences between production forest and unmanaged permanent forest is evidenced in the document in Chapter 2, with the negative impacts of land use change outlined resulting from unmanaged permanent forests, not forests managed primarily for timber production which demonstrably provide greater environmental, employment and economic benefit than other "productive" primary land uses.

Similarly, the restrictions in land use flexibility are overstated, ignores the opportunity to offset (either through afforestation of other reductions) and disregards the fact that capital will migrate to least cost reduction or offset opportunities.

Given the long-term nature of forest investment and commercial arrangements, to preserve the integrity of the ETS, it is imperative that any changes must grandfather all existing forestry NZU units, all future units derived from CAAs already registered, and all existing arrangements. If this is not explicitly recognized, then changes will further undermine market confidence and infringe on private property rights and contractual arrangements.

Strengthening complementary measures

The Government has the ability to use complementary measures to deliver on the range of outcomes desired from the ETS.

Complementary policy measures are available to manage any emerging demand side or supply side imbalances, unintended consequences, or adverse effects. A number of these complementary measures are already in place to mitigate supply or demand side effects including;

- Free Industrial allocations
- Auction and Cost Containment Reserve volumes

- GIDI funding ($140M to NZ Steel, $90M to Fonterra to accelerate decarbonization plans)

The potential exists to further strengthen these complementary measures through more regular review and extension to further interventions such as;

- direct support to households and communities particularly those most adversely affected and with less access to low emission alternatives.
- restrict the level of entry for forest offsetting to the ETS, with reference to the CCC's recommendations on the required levels of afforestation (although note that this should be managed centrally rather than delegated to local councils to ensure that NZ Inc objectives are met)

A suite of well-considered and flexible complementary measures will allow direct support or incentivization to different sectors of the economy and will provide the highest chance of successfully achieving the governments objectives.

In Summary

Matariki Forest rejects the contention that the ETS in its' current form is broken, and the conclusion that forestry units require constraint is premature.

Given the uncertainty in modelling, there is not yet enough evidence that the ETS will lead to an oversupply of NZUs in the mid 2030's. There is still time to continue to monitor and action as required using a range of complementary measures.

We support the situation continuing to be monitored, and if more robust data clearly illustrates supply of NZUs exceeds demand and therefore diminishing incentives for emissions reductions, this can be managed through strengthened complementary measures. Such measures can be applied to both the demand and/or supply side to actively manage incentives of particular sectors of the economy, including support to households and communities most adversely affected by the economic cost of transition to a low carbon economy.

Irrespective of any changes to the ETS, it is imperative that any changes must grandfather all existing forestry NZU units, all future units derived from CAAs already registered, and all existing arrangements including those of emitters.

Publication of Submission

Matariki does not object to this submission being made public.

Yours sincerely

Jason Syme
Director Forest Investment
Rayonier NZ Ltd

11 August 2023

NZ ETS Review
Ministry for the Environment
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Via email: etsconsultation@mfe.govt.nz

Methanex New Zealand Limited – Review of the New Zealand Emission Trading Scheme

Methanex welcomes the opportunity to respond to the consultation document issued by the Ministry for the Environment on 19 June 2023 (*"Review of the New Zealand Emissions Trading Scheme").*

For background on Methanex New Zealand please see the attachment at the end of the submission.

Net vs Gross and regulatory stability

The four ETS options being considered all involve a material change from net reductions to gross emission reductions. Methanex does not support such fundamental change to the Zero Carbon Act, so soon after it was implemented, which undermines the integrity of the Act and significantly increases investment uncertainty.

The Climate Change Response Act was passed on a bipartisan basis to achieve **net**-zero emissions by 2050. At the time of passing (2019), considerable work was done to ensure that the bill was passed on a bi-partisan basis which required negotiation and compromise between the parties.

This approach was taken in recognition of the multi-decadal effort required to build a low-carbon economy and prosperous society. An environment where New Zealand's emissions policy is fundamentally modified on a frequent basis does not support long-term decarbonisation. The bi-partisan approach sought to create a durable policy environment that is supportive of long-term investment in decarbonisation whilst ensuring a low cost, orderly transition that recognises the social and economic expectations of New Zealanders.

Allowing concerns about the sustainability of current carbon removal approaches[1] to override the primary purpose of the bill to reduce net emissions undermines long-term policy integrity and stability and adds to the investment uncertainty already created by the: oil and gas ban, 100% renewable target, NZ battery project, various NZ ETS setting changes and the difficult, time consuming and at times litigious consenting processes (to name just a few major energy-related issues).

[1] While forestry is the only widespread removal approach applied in New Zealand today, that will not always be the case if other capture, utilisation and storage technologies are included and/or remain in the ETS.

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The NZ ETS has only been a genuine cap and trade market since 2021 (for emissions up to and including 2020 a fixed price option was available). Given the magnitude of the ETS, its wide-ranging impacts, the fact it has bi-partisan support and the action that it has already driven, it is disappointing that the fundamental objectives of the scheme are being re-evaluated so soon, especially when it is evident that the current settings are delivering decarbonisation.

The fact that the current ETS review process has not ruled out retrospective changes to the ETS is particularly disruptive to investor confidence and will likely have impacts beyond the forestry sector and further degrade New Zealand's reputation as an investment destination.

Methanex understands the concern that externalities associated with ETS-driven afforestation may not be properly addressed within the ETS. If these concerns are to be addressed, they should be done through the relevant land-use legislation and not through the structure of the ETS.

Increased ETS costs and gross emissions reductions

The proposed reforms seek to implement changes that increase ETS costs on emitters. The extent to which carbon costs exceed those of international comparators will not assist in the decarbonisation journey and will cause New Zealand economic harm.

Methanol manufacturing is a "hard to abate, energy intensive, trade-exposed" [2] industry. Current ETS costs in New Zealand are significantly greater than our international comparators and the proposed approach to increase these costs without regard for our industry's international competitiveness will reduce the competitiveness of our operations and, due to a lack of economic alternatives to current production methods, will drive an adverse effect on global emissions.

Methanex primarily sells its product to China where the alternative production method uses coal. Producing methanol from coal has around 5-6 times more emissions than producing methanol from natural gas and yet faces no carbon charge, which makes coal-based production more globally competitive even though it is a higher emission feedstock than gas. We cannot responsibly accept adopting a policy setting in New Zealand that will encourage higher emission production methods internationally.

To ensure New Zealand businesses can thrive, the ETS framework should aim to preserve New Zealand's industry-specific competitiveness together with decarbonisation goals. Ensuring that the NZ ETS' settings give Emissions Intensive Trade Exposed entities assurance that New Zealand's long-term emissions costs will not get out of step with global comparators will maximise New Zealand's contribution to global emissions reduction and New Zealand's prosperity. This must be stable and reliable over long investment time-frames.

The four options that are being considered to reform the ETS are all targeted at making New Zealand emission intensive industries less competitive while risking increasing global emissions. Making such NZ-based industries globally uncompetitive is inconsistent with the government's stated aim of "decarbonising without deindustrialising".[3]

[2] See Appendix 2 for explanation of this phrase.
[3] Decarbonise, don't de-industrialise – Woods | BusinessNZ Energy Council (bec.org.nz)

Industrial Allocation

Option 1 of the consultation document contemplates a reduction in Industrial Allocations. In the context of the New Zealand ETS, the Industrial Allocation regime is essential to the international competitiveness of emission intensive businesses.

With the planned phase-out of Industrial Allocations and the rapidly increasing ETS price, Methanex's exposure to emissions costs is increasing rapidly and faster than international comparators. Below are some of the recent regulatory initiatives that have increased or plan to increase ETS costs for Methanex in New Zealand:

- The passage of the Zero Carbon Act and with it the removal of the fixed price option from 2021 onwards
- Prices rapidly rising to the ceiling price after the removal of the fixed price option
- Very significant increase in the ETS auction ceiling and floor prices from this year onwards[4]
- The changes to industrial allocation that are currently before parliament for its second reading[5]
- Longer-term changes to Industrial Allocations and the potential introduction of a Carbon Border Adjustment Mechanism (which does not protect exporters) floated in the Emissions Reduction Plan[6]
- This consultation and review of the ETS.

Methanex sees merit to investigating the possibility of industry specific rates for Industrial Allocations to reflect the risk of "carbon leakage" for specific industries. While all recipients of industrial allocations are Emissions Intensive and Trade Exposed entities, not all operate in hard-to-abate sectors like Methanex. Similarly, the rate at which international regulations and decarbonisation is progressing around the world varies greatly depending on the industry.

In Methanex's case, we would expect an industry-specific rate to align with the carbon costs faced by methanol producers globally. Any change that results in a reduction in Industrial Allocation and an increase in carbon costs will negatively affect Methanex's competitiveness and would not be consistent with the government's aim of decarbonising without deindustrialisation.

[4] Government announces updated NZ ETS auction settings | Ministry for the Environment
[5] Climate Change Response (Late Payment Penalties and Industrial Allocation) Amendment Bill (bills.parliament.nz)
[6] https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf, page 107

Decarbonisation and Methanex

At the current 2023 level of protection under the Industrial Allocation scheme and NZU pricing, there is sufficient incentive to support investment in decarbonisation. The ETS is working and can be demonstrated through decarbonisation projects taking place under the current pricing structure. For example, in 2022, Methanex announced a project that will reduce its New Zealand emissions by 50,000 tonnes per annum. [7]

However, a higher ETS price or reduced industrial allocation would not necessarily increase execution capacity (capital budget, technical resources, planning timeframes and supply chain all play a limiting role in the rate at which projects can be executed) for such projects in hard to abate sectors. If taken too far, too fast, ETS costs could reach a level beyond which decarbonisation investments are not incentivised and investor confidence is undermined.

Deep decarbonisation of energy intensive operations requires development of green feedstocks such as biogas and abundant affordable renewable electricity. This could be a potential export opportunity for New Zealand.

Methanol is increasingly recognised globally for its potential to decarbonise key industries such as international shipping. Methanol produced from biological sources and green hydrogen is one of the few options for decarbonising this industry that makes up ca. 3% of global emissions. Methanex has been industry leading in developing methanol as a shipping fuel[8]. See Appendix 3 for further information.

However, reaching the required scale with such alternatives will take decades and an ETS price that increases too far, too fast (i.e. at a faster rate than global competitors) risks cutting off a transition path to green alternatives.

Summary

While concerns about the extent to which afforestation will contribute to New Zealand's emission reduction targets may be legitimate, these should be addressed via land-use legislation not through fundamental changes to the ETS structure and settings. These should aim to be stable, with protection mechanisms to ensure ongoing global competitiveness over the long term with enduring bi-partisan support.

Investment confidence is important to ensure that New Zealand is seen as an attractive investment destination. Rapid changes to fundamental aspects of the NZ ETS (e.g. the focus on gross rather than net emissions) so soon after its implementation undermines the investor confidence required to attract such investment.

Methanex has the ability to decarbonise, but doing that requires globally competitive carbon costs and energy prices throughout the decades long transition. Carbon costs that increase too far and too

[7] https://www.methanex.com/news/release/methanex-invests-in-technology-to-reduce-emissions-at-new-zealand-site-by-over-50000-tonnes

[8] https://www.methanex.com/news/release/methanex-and-mol-complete-first-ever-net-zero-voyage-fuelled-by-bio-methanol

fast put the transition at risk and are therefore not consistent with New Zealand's aspiration to decarbonise without deindustrialising.

Yours sincerely,

[redacted]

Stuart McCall
Managing Director
Methanex New Zealand Ltd.

[redacted]

Appendix 1: Background on Methanex NZ

Methanex Corporation is the world's largest producer and supplier of methanol and has significant production capacity in Taranaki, New Zealand. Methanex operates the Motunui site with two methanol production plants and the currently mothballed Waitara Valley site.

Methanol produced in New Zealand by New Zealanders, from indigenous feedstock, has been an important part of the country's economy for more than 40 years. Methanex provides over 200 highly skilled people with careers, indirectly supports another 3,000 jobs and the domestic industrial supply chain, delivers export earnings that are significant on a national scale and contributes meaningfully to regional New Zealand[9].

Methanol is a fundamental building block used by all economies, including in New Zealand. Demand for methanol continues to grow as a commodity chemical used in the manufacture of essential everyday applications and in low-carbon energy technologies such as solar panels, wind turbines and electric vehicles.

Global demand for methanol is also increasing in clean-burning fuel applications. Methanol can deliver immediate emissions improvements through its use as a clean-burning fuel for marine applications, biofuel manufacture and fuel blending in vehicles. Blending methanol into petrol also enhances vehicle performance and efficiency and improves air quality.

Methanol in New Zealand is produced from gas, the lowest emission production method currently deployed at scale globally. Methanex is also actively evaluating lower-carbon production opportunities and is committed to becoming more efficient and generating fewer emissions. For example:

- A new position on our global executive leadership team dedicated to Low Carbon Solutions was established this year, demonstrating our commitment to identifying and executing opportunities for lower carbon methanol production
- Our production facility in Louisiana, USA has achieved international certification for bio-methanol production and fuelled the world's first trans-Atlantic net-zero shipping voyage.[10]
- Our joint venture with Carbon Recycling International established the world's first renewable methanol plant using emission-to-liquids technology in Iceland.
- In 2022, Methanex New Zealand announced a decarbonisation project that will reduce its domestic emissions by 50,000 tonnes per annum which is currently being executed.

We believe in developing and implementing solutions that make incremental improvements in the short term, while simultaneously working towards longer-term carbon-zero solutions. We are investigating opportunities in our industry to produce lower carbon methanol from biomass or synthesised from green hydrogen and carbon dioxide, using biomethane as a feedstock or by capturing and using or storing emissions generated in the production process.

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[9] As a Responsible Care® company our contribution to regional NZ is not confined to jobs. For example, in December 2022 Methanex committed $ 2 mln to support a new neonatal unit for Taranaki.
Methanex Makes NZ$2 Million Investment in Neonatal Unit to Support Taranaki, New Zealand Community | Methanex Corporation

[10] https://www.methanex.com/news/release/methanex-and-mol-complete-first-ever-net-zero-voyage-fuelled-by-bio-methanol

Appendix 2: Hard to Abate, Energy Intensive Trade Exposed Entities

"Hard-to-abate"[11] means that the technology to decarbonise is either not available, immature or uneconomic to deploy today. It is a term used to identify those industries that will decarbonise later than industries where decarbonised alternatives are available and economic like light transport, electricity generation and low-to-medium temperature process heat.

"Energy intensive" is a term to signify the importance of energy and energy costs to a business. It is defined in terms of the magnitude of energy costs relative to revenue. Methanex is New Zealand's largest energy user.

"Trade exposed" means that Methanex's production is exposed to international competition that may not face the same emissions costs as in New Zealand, meaning that the carbon costs can't be passed on to customers. Methanex sells its production primarily to China where the alternative production method is to produce methanol from coal.

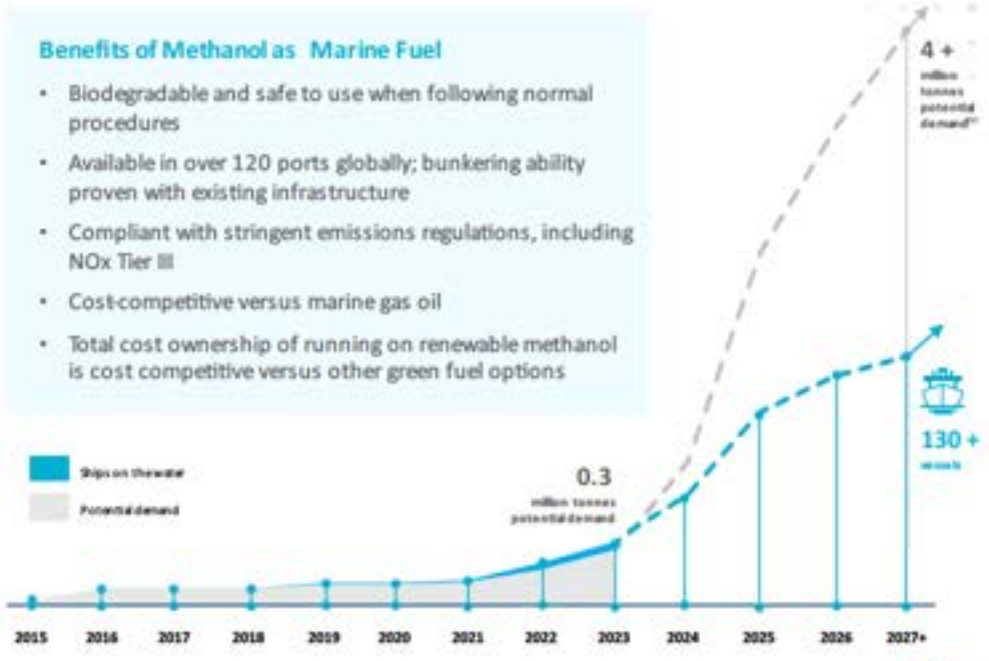
[11] https://www.iea.org/reports/achieving-net-zero-heavy-industry-sectors-in-g7-members/executive-summary (para. 4)

Growing Interest in Methanol as a Marine Fuel

- Over 130 dual fueled vessels are expected to be on the water by 2028
- Helping the shipping industry meet their decarbonization goals

Benefits of Methanol as Marine Fuel

- Biodegradable and safe to use when following normal procedures
- Available in over 120 ports globally; bunkering ability proven with existing infrastructure
- Compliant with stringent emissions regulations, including NOx Tier III
- Cost-competitive versus marine gas oil
- Total cost ownership of running on renewable methanol is cost competitive versus other green fuel options



[1] Based on orders as of February 2023 if all ships run on methanol 100% of the time

Major Electricity Users' Group

11 August 2023

James Palmer
Chief Executive
Ministry for the Environment
23 Sheppard Place
WELLINGTON 6011

Sent via email: etsconsultation@mfe.govt.nz

Dear James

Review of the New Zealand Emissions Trading Scheme

1. This is a submission from the Major Electricity Users' Group (MEUG) on the Ministry for the Environment (MfE), the Ministry of Business, Innovation and Employment (MBIE) and Ministry for Primary Industries (MPI) discussion document "*Te Arotake Mahere Hokohoko Tukunga: Review of the New Zealand Emissions Trading Scheme*"[1] published for consultation on 19 June 2023.

2. MEUG members have been consulted on this submission. This submission is not confidential. Members may lodge separate submissions.

Overview of MEUG's submission

3. MEUG supports a credible and robust New Zealand Emissions Trading Scheme (NZ ETS) that supports our country in meeting our climate change targets. The Government recognises the ETS as its "*main emissions pricing tool*" and acknowledges the "*critical role*"[2] it plays within New Zealand's climate change policy. Many of MEUG's members have direct obligations under the NZ ETS, while all members face the cost of carbon through their electricity prices and fuel costs.

4. MEUG has several fundamental concerns with the proposals set out in this discussion document and believes that this ETS review has severely damaged confidence in the carbon market. We consider that:

   a) This review introduces a significant level of political and regulatory uncertainty into the carbon market and has the potential to seriously impact property rights, does not swiftly rule out any retrospective changes to carbon

[1] https://environment.govt.nz/assets/publications/climate-change/Review-of-the-New-Zealand-Emissions-Trading-Scheme-Discussion-Document.pdf
[2] cussion d

b) The discussion document fails to properly consider the other tools that Government could utilise to address its concerns with the role of forestry, and rather relies on substantial changes to the NZ ETS.

c) The discussion document provides very limited analysis of the four options, making it difficult for submitters to provide meaningful comments on the options.

5. We expand on each of these points below.

Poor regulatory approach significantly impacts on property rights

6. MEUG is concerned that this NZ ETS review has had a significant detrimental impact on market participants, damaging their confidence in the New Zealand carbon market. The scope of some of the proposals would not only severely impact New Zealand foresters but would also impact any participants who currently hold forestry units to meet their obligations.

7. This review creates more uncertainty, which is counter to the intent of the NZ ETS, where a "*strong and stable emissions price signal should encourage greater climate action across the economy*".[3] The NZ ETS has already undergone several refinements, with the discussion document[4] itself noting the numerous consultations that have been undertaken over the last three years.

8. What is the most concerning to MEUG is that the discussion does not rule out the possibility of retrospective changes to the rights of forestry currently registered in the NZ ETS. The discussion document introduces the concept of vintaging which would "*put on expiry date on units being held by participants in the NZ ETS stockpile*"[5]. Option 1 also discusses the option of using existing levers such as industrial allocations, at a time when MEUG note that government is already considering changes to industrial allocations through the *Climate Change Response (Late Payment Penalties and Industrial Allocation) Amendment Bill.*[6]

9. To foster a supportive investment environment where businesses are confident to invest in decarbonisation projects, the Government needs to ensure clear and unambiguous property rights without constant amendments to the scheme. We strongly recommend that the Government rule out any retrospective changes to the fungibility of currently held NZ units or the future use of NZUs from investments already made before it proceeds with any further work on this review.

Blunt measure to address forestry issues

10. MEUG is concerned that the Government has not fully considered the policy tools it has available outside of (yet complementary to) the NZ ETS to drive a change in forestry focus.

11. We recognise that as the "*NZ ETS does not distinguish between emissions reductions and removals…..it is likely the NZ ETS will continue to drive considerable carbon removals from exotic forests* and *wont lead to significant indigenous afforestation or promote other nature-based solutions that can remove carbon from the atmosphere."*[7] We also agree with the statement that while forestry is an important means of removing carbon

[3] Page 14 of the discussion document.
[4] See pages 22/23 of the discussion document.
[5] Page 63 of the discussion document.
[6] https://bills.parliament.nz/v/Bill/de05f452-bb22-4288-b5ef-345da2194394?Tab=history
[7] Page 11 of the discussion document.

dioxide from the atmosphere:

> *"….it can also achieve other strategic objectives. These include providing long-term carbon sinks (including those that enhance indigenous biodiversity); improving freshwater outcomes; building resilience to the impacts of climate change; and providing economic opportunities for landowners, including tangata whenua."*[8]

12. In the discussion document, the Government sets out the need to use a portfolio approach to drive emissions reductions and removals across New Zealand. We would encourage the Government to extend this approach to addressing the issues and opportunities it sees facing the forestry sector.

13. MEUG has reviewed the BusinessNZ Energy Council's submission and supports its recommendation for a comprehensive assessment of all aspects impacting afforestation economics and potential planting, including factors beyond the carbon price to formulate robust policies and solutions.

Limited analysis of options hampers input from stakeholders

14. The Government has identified four high-level policy options that could be adopted if the decision is made to use the NZ ETS to prioritise gross emissions reductions, while maintaining support for removals. These range from using existing levers within the NZ ETS differently (such as auction volumes), to incentivising removals through an entirely different system from the current NZ ETS. While the paper provides a description and an initial assessment of these four options, we are disappointed that there is very little detailed analysis, particularly quantitative in nature.[9] The options are relatively broad, with not much specific detail. This makes it difficult for submitters to understand the true costs and benefits of the options and state a preference for any of the options.

15. MEUG supports the BusinessNZ Energy Council's recommendations that the Government should:

    a) Conduct a comprehensive quantitative analysis to determine the level of gross emission reductions intended up to 2050 before any options are decided, and

    b) Include a comprehensive assessment of the costs and benefits of each option in rebalancing the ETS towards more gross reductions. This should include assessing non-ETS regulatory measures aimed at managing and constraining afforestation, without changing the current ETS structure and undermining its effective price signal.

16. We consider that the preparation and consultation on this level of information would enable submitters to provide more insightful submissions and enable Government to make more informed decisions on the direction for the NZ ETS.

[8] Page 14 of the discussion document.

[9] We note that the discussion paper actually provides more commentary on the context for the review, in contrast to discussion of the options.

17. If you have any questions regarding our submission, please contact MEUG on [redacted]

Yours sincerely

Karen Boyes
Major Electricity Users' Group

A Coherent Systems Based Approach to Farm/Climate/Biodiversity Policy

A win win for the farmers and the nation

How soil carbon structure is built and maintained

Farmers need policies that will support them through the tough times. They are the ones who will make farming more competitive and help reduce our emissions. They are facing hard times and we need agricultural policies that support them through the problems of pine plantations carbon farming which is pushing up the price of farms, putting them beyond reach; fresh water regulation and proposals to price on-farm emissions; and the low milk price falling below the cost of production.There has to be a better way to deal with these problems than to increase their costs by imposing an emissions price.

A number of farmers have started to use multi species pasture mixes which have enabled them to improve profitability by eliminating fertiliser costs.

Hyundai Country Calendar – Season 2020, Episode 7,
Hyundai Country Calendar – Season 2021, Episode 18,
Hyundai Country Calendar – Season 2022, Episode 17,

Much to the surprise of some there has been a marked improvement in productivity and stock health. Soil productivity is increasing being studied and advances in microscopy and DNA analysis techniques have aided these research efforts and shed light on why Multi species pastures increase productivity. One study stands out. It has found that plant productivity is supported not by fertiliser but by soil biology. In particular it is the large diversity of microorganisms and the interplay between bacteria and fungi that contribute to the vital siol function of decomposing organic matter, cycling nutrients generating soil structure and suppressing plant diseases and supporting productivity. (see citation below)

Streptomyces polyketides mediate bacteria–fungi interactions across soil environments |

"In all known habitats on Earth microorganisms form diverse consortia with a multitude of prokaryotic and eukaryotic microorganisms1. These microbial consortia provide services crucial for life2. For example, soil systems host a large diversity of microorganisms that contribute to its vital functions such as the regulation of nutrient cycling, decomposition of organic matter, generation of soil structure, suppression of plant diseases and support of

plant productivity 3,4,5. In particular, the interplay between bacteria and fungi seems to be critical for community functionality, and alteration of the balance between these microorganisms emerges as a potential cause of disease6,7. For example, lichens are composed of fungi and phototrophic microorganisms like algae or cyanobacteria8. They provide microhabitats for many bacteria, thus forming a complex microbial consortium9. Similarly, it was demonstrated that microorganisms from different kingdoms drive the assembly of microbiota in preterm infants10. Therefore, elucidation of functional interactions between bacteria and fungi that determine the composition of healthy microbial consortia has attracted increased attention".

The demonstration that microorganisms from different kingdoms drive the assembly of microbiota is revealing in terms of the productivity benefits of multi species pasture mixes which include species across a number of kingdoms. Plant seeds embed their mothers' microbiome. When the seed sprouts it is that microbiome that replicates itself in the soil. Each plant family, each species, in fact each seed, requires a particular cocktail of nutrients. Each seed specific microbiome and the exudates that feed and nourish it, is calibrated to elicit that exact mix of nutrients from soil organic matter and rock particles.

This is achieved by a process of microbial decomposition. It requires energy - the microbial respiration of organic carbon into carbon dioxide. There are two available sources of carbon: soil organic matter and exudates (the liquid carbohydrate food that plants release through their root systems to target the rhizosphere microbiome where exudates are traded for mineral nutrients.

The carbon use efficiency of the mineralising microbiome determines how much available carbon is respired as CO2 and how much remains to generate soil structure. The more carbon efficient the microbes are the greater the addition to soil structure. In the literature soil structure is variously termed: porous soil carbon structure, the soil carbon sponge, or simply crumb structure. These varying terms serve to emphasise its low bulk density, or spaciousness, capacity to infiltrate and hold water, and to exchange gases. Water is a necessary ingredient of photosynthesis. It is also necessary for transpiration (plants water cooling system). The microbiome is largely aerobic so gas exchange is important for microbes to breathe: in and out. See the scientific paper on the qualities of porous soil structure below.

Nature Microbiology Exploring the relationship between soil structure and soil functions via pore-scale imaging - ScienceDirect

In a parallel leap in understanding of the productive capacity of biology,a technique of decomposing organic matter that generates highly diverse and fugally dominant microbial populations has been developed in the United States. When an inoculant from this compost was applied to successive crops of corn and pinto beans it was found to have drawn down 11t of soil carbon per hectare. Small scale production of this type of compost is underway in Auckland.

Biologically Enhanced Agricultural Management with Dr. David Johnson & Hui-Chun Su

The potential of soils to absorb much greater volumes of carbon than previously thought is revealed by recent research. See below

No detectable upper limit of mineral-associated organic carbon in temperate agricultural soils - Begill - Global Change Biology - Wiley Online Library

Farmers who have adopted multi species pasture mixes have found that they have improved productivity at the same time as eliminating synthetic nitrate fertilisers. This seems to be due to the ability of the pasture to enhance biological activity in the rhizosphere enabling plant roots to ingest bacteria whole and strip them of nitrogen in the preferred form of amino acids and amino sugars. It requires less energy for the plant to synthesise its protein requirements from bacterial protein rather than from nitrates.

For this and other reasons farming with nitrates creates a yield drag.

How Excess Nitrogen Creates Yield Drag | John Kempf and Advancing Eco Agriculture

Nitrates also interfere with the ability of methanotrophs (which feed on methane and exhale it as CO2) to thrive. Farming with nitrates is associated with soil compaction - in other words the destruction of porous soil carbon structure. It is that gas exchanging water holding property of fertile soil in which methanotroph populations thrive. So by farming without nitrates and using multi species cover crops along with particular compost inoculant as biostimulant the problem of methane emissions could be drastically reduced.

Grazing weakens competitive interactions between active methanotrophs and nitrifiers modulating greenhouse-gas emissions in grassland soils | ISME Communications

Porous soil carbon structure avoid methane emissions to the atmosphere and waterways because the breakdown of soil organic matter is aerobic

Global methane emissions from rivers and streams | Nature

To round off this diversion into the topic of methane Walter Jehne goes into the related topic of how water vapour emitted in the course of forest transpiration is photo oxidised which generates hydroxyl ions which are a powerful free radical that rapidly degrades atmospheric methane into carbon dioxide. This makes a good case for farming in association with diverse native forest on steeper slope to tackle the methane and erosion problem at the same time. With these combined strategies methane emissions should be all but eliminated without the need of vaccination nor feed supplementation, beside the chicory and plantain which will be in the mixed pasture. See the presentation below in which the important topic of the cooling power of transpiring vegetation with access to the soil carbon sponge (porous soil carbon structure) is dealt with in detail.

The Soil Carbon Sponge, Climate Solutions and Healthy Water Cycles with Walter Jehne

It has been known since 1944 and earlier that farming with synthetic nitrates respires soil carbon into the atmosphere causing GHG emissions and soil compaction nitrous oxide emissions agricultural runoff river pollution and ocean dead zones - infamously in the Gulf of Mexico. The same scenario is presently unfolding in the Hauraki Gulf with the loss of fish population and sea bird, starving snapper and blue penguins. See below

The Soil and Health, Sir Albert Howard 1999 (First Published 1944), (p.50)

“The use of artificial fertilisers, particularly sulphate of ammonia: Even where there is a large safety margin, i.e., a large reserve of humus, such dressings do untold harm. The presence of additional combined nitrogen in an easily assimilable form stimulates the growth of fungi and other organisms which, in the search for the organic matter needed for energy and for building up microbial tissue, use up first the reserve of soil humus and then the more resistant organic matter which cements the soil particles. This glue is not affected by the processes going on in normally cultivated soil, but it cannot withstand the same processes when stimulated by dressings of artificial fertilisers.”

The accuracy of this prognosis was borne out decades later as a result of trials in the USA:

Synthetic nitrogen destroys soil carbon, undermines soil health | Klipopmekaar (University of Illinois) May 2017

“Fertiliser is good for the father and bad for the sons.”
–Dutch saying

Among other things, the study shows the concern that as organic matter dissipates with the continued use of nitrates, the soil’s ability to store organic nitrogen declines; and so it is a treadmill effect in that as the ability to store organic nitrogen is compromised “the only thing that can help heavily fertilised farmland keep cranking out monster yields: more additions of synthetic N.”

As the soil becomes more compacted, it is vulnerable to runoff and erosion and limits the growth of stabilising plants. It becomes more reliant on irrigation – as the researcher said “the soil is bleeding”.

We are now reaping the consequences of decades of nitrate farming - an annual accumulation of 30btCO2 on top of the 40btCO2e attributable to the burning of fossil fuel. We have the capacity to start immediately to draw down that 30bt CO2 immediately by reforming our farming practices - the combination of abandoning nitrates, use of multi species pastures, biostimulation and transpiring native forest on steeper slopes. Why not do so and by example encourage others to do so too? see the scientific paper below

Estimates of the carbon cycle—vital to predicting climate change—are incorrect,

"Photosynthesis and respiration are the driving forces of the carbon cycle, however the total annual sum of each of these at the global scale has been elusive to measure," What Jian and Steele, along with the rest of the team, found is that by using the gross primary productivity of carbon dioxide's accepted number of 120 petagrams—each petagram is a billion metric tons—the amount of carbon coming out through soil respiration should be in the neighbourhood of 65 petagrams.
By analysing multiple fluxes, the amount of carbon exchanged between Earth's carbon pools of the oceans, atmosphere, land, and living things, the researchers discovered that the amount of carbon soil respiration coming out of the soil is about 95 petagrams. The gross primary productivity should be around 147. For scale, the difference between the currently accepted amount of 120 petagrams and this estimate is about three times the global fossil fuel emissions each year.
According to the researchers, there are two possibilities for this. The first is that the remote sensing approach may be underestimating gross primary production. The other is the upscaling of soil respiration measurements, which could be overestimating the amount of carbon returned to the atmosphere. Whether this mis-estimate is a positive or negative thing for the scientifically proven challenge of climate change is what needs to be examined next, Steele said: “The next step for the research is to determine which part of the global carbon cycling model is being under or overestimated.”

The circumstances traversed above supports the conclusion that the cause of the problem is nitrate caused respiration of soil carbon. diversity of the soil microbiome, achieve a good balance and increase productivity and generation of soil structure.

Cooling benefits of Transpiration no longer any rationale for pine carbon farming

The cooling benefits of GHG reduction will be massively amplified by transpiration associated with water retentive landscapes. The benefits of transpiration are so great that scientists now say that the primary benefit of forests is not the carbon captured in their growing stems. Instead it is their cooling transpiration. Although carbon storage is still important it must be considered a secondary “co-benefit”.

It so happens that the transpiration capacity of diverse native forest far exceeds that of monocrop plantations of dry flammable pine trees. Rather than promoting such plantations, the Emission Trading Scheme (ETS) should be positively directed towards the rejuvenation of diverse moist native forest ecosystems in conjunction with pasture management strategies aimed at reviving porous soil carbon structure.

Soil moisture–atmosphere coupling accelerates global warming | Nature Communications; Trees, forests and water: Cool insights for a hot world - ScienceDirect

See also (referred to above)

Erosion

Sir Albert Howard in 1944 analysed the causes of erosion and that analysis is helpful to understand the crises we currently face with repeated extreme rainfall events in Tairawhiti, Esk Valley, Nelson and elsewhere.

This is what he had to say:

“That the cause of soil erosion is “mis-use of the land, resulting from the destruction of the compound soil particles. In dealing with the remedies that have been suggested … it is essential to envisage the real nature of the problem. The task at hand is nothing less than the repair of Nature’s drainage system - the river - and of Nature’s method of providing the countryside with a regular water supply. The catchment area of the river is the natural unit in erosion control. In devising this control, we must restore the efficiency of the catchment area as a drain, and also as a natural storage of water. Once this is accomplished, we shall hear little more about soil erosion.”...

“If we regard erosion as the natural consequence of improper methods of agriculture, and the catchment area of the river as the natural unit for the application of soil conservation methods, the various remedies available fall into their proper place.

- The upper reaches of each river system must be forested;
- Cover crops, including grass and leys, must be used to protect the arable surface whenever possible;
- The humus content of the soil must increased and the crumb structure restored so that each field can drink in its own rainfall;
- Overstocking and overgrazing must be prevented;
- Simple, mechanical methods for conserving the soil and regulating the runoff, such as terracing, contour cultivation and contour drains must be utilised. …

First and foremost is the restoration and the maintenance of the crumb structure of the soil so that each acre of the catchment area can do its duty by absorbing its share of the rainfalL”

Japan provides perhaps the best example of the control of soil erosion in a country with torrential rains, highly erodible soils, and a topography which renders the retention of the soil on steep slopes difficult. Here, erosion has been effectively held in check by methods adopted regardless of cost, for the good reason that the alternative to their execution would be national disaster.”

In these passages the references to soil crumb structure of the soil is a reference to porous soil carbon structure, and that is relevant to restoring the efficiency of the catchment area as a natural storage of water.

His reference to the need for forestation of the upper reaches of the river systems supply both the water absorbent humus content and porous soil structure on the steeper slopes of catchment areas. When you take into account New Zealand’s high usage of synthetic nitrates and deforestation

watersheds and subsequent establishment of extensive monocrop plantations of pine trees and clear felling it is little wonder that these affected watersheds have suffered repeated extreme erosion events. The solution must be to restore the diverse native forest and the fauna and fungi which is the co-evolved ecosystem best suited to thrive on that land, and that ecosystem needs to be protected by eradication of exotic pests so that the understorey is not grazed and pests do not eat the foliage and birdlife, and the agriculture activities on the flatter land needs to rapidly build soil carbon structure and buffering water holding and drainage capacity.

It should be noted that avoiding drought in the Waikato is a very necessary thing to do. Drought causes the ground to absorb ultraviolet radiation from the sun, concentrate and re-radiate it as infrared radiation, the escape of which is blocked by GHGs which can cause heat domes to form over the Waikato. High ocean temperatures can cause a matching high pressure dome off the East Coast. In the narrow coastal channel between, atmospheric rivers from the tropics are compressed and discharge their water in torrents, unleashing havoc on the forests, farms and settlements below.

The farming reforms referred to above will in time resolve the problems in these East Coast areas. The problem is huge but needs to be tackled at the root cause level.

Hauraki Gulf

This is another casualty of conventional agriculture

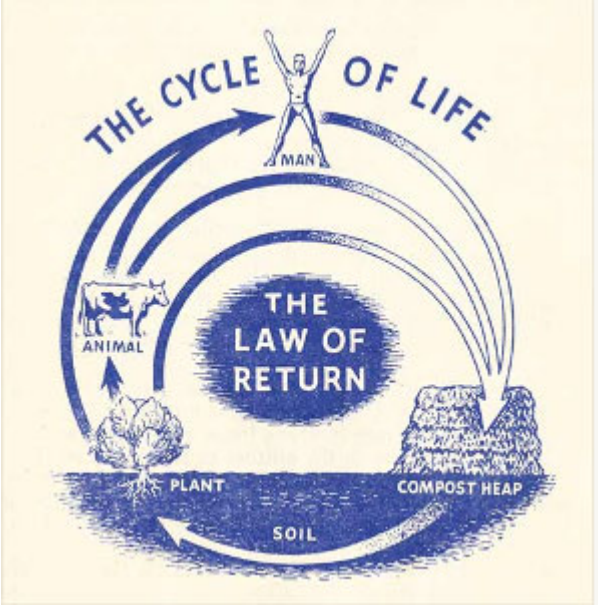
It is pointless to ban bottom trawling in limited, as yet undefined, areas of the Hauraki Gulf without stemming the flow of 4,000 tonnes of fugitive nitrates from nitrate agriculture in the watershed. We need to get serious about global warming. Watersheds need to be farmed with multi-species pasture mixes that supplant synthetic nitrate fertilisation, and steeper land and the land in the head waters (in this case, the Waiau and Piako rivers) need to be re-forested with diverse native forest and strict pest control.

The peat lands need to be re-wetted and free of farming. In this way, the Hauraki Dairy Company (shall we say) will be generating massive income from carbon sequestration and from the emergent benefits of rectifying connected ecosystems in a coherent whole.

This approach can be applied through New Zealand – it can be applied to the Manukau Harbour, to the Kaipara Harbour, to the Bay of Islands, everywhere.
The watershed approach – the need for bold steps

- Reforestation with diverse natives in the headwaters, on steeper slopes, in gullies, riparian zones and corridors. This will mean diversity for health and year round supply of food sources to establish local stable populations.
- Adopt Sir Albert Howard's example of Japan, as there are similarities to the NZ landscape - the need to do it whatever the cost see the following passage which is very applicable to NZ conditions.

How soil carbon is destroyed by the role of synthetic nitrates.



ANAEROBIC DIGESTION

Soil biologists from the International Solid Waste Association (ISWA) have examined the issue as to whether from an environmental point of view food waste should be composted or treated by way of AD. They concluded emphatically that the only appropriate thing to do with food waste is to compost it and use it in agriculture to grow food. Their reasoning was that conventional agricultural practices have led to the wide scale destruction of soil carbon and soil carbon structure which has resulted in a situation where 40% of the earth's arable soil are moderately to severely degraded, and that by composting food waste and using it for agricultural purposes will restore soil carbon, soil carbon structure, soil health and soil fertility. They concluded that AD would not do so.

Dr Azbeta Bouskova, General Manager of Ecogas NZ, recently expressed the same view. Asked whether ecosystems can withstand the massive loss of organic matter from the soil that is consequent upon industrial scale of AD of food waste, she responded that composting food waste is absolutely essential, and she would not argue with that.

Anaerobic digestion diverts food waste from its highest and best use urban composting building porous soil carbon structure and cooling transpiration capacity: and Urban farming for food security resilient communities, sponge cities and much more. AD puts organic resources into the atmosphere as GHG and leaves a residue digestate of reactive nitrates which is touted as "treasure" and "fertiliser". It is in fact a toxic waste which will become a disposal problem in short order. Its very existence and the ecological claims that are made in its support, probably actionable green washing, teaches away from a coherent ecosystem

understanding and a better solution. It's inconsistent with moving away from the use of nitrates in farming and it sows confusion. It involves a heavy opportunity cost- the opportunity to galvanise action around a coherent climate policy and community participation. It cuts across the proposal to teach Earth science in schools in a way that coheres with what we are actually doing. The diagram above shows exactly what needs to happen. Instead it will be a 20 year suppression of innovation and public participation.

Richard Wallis
August 2023

[redacted]

Submission points for ETS review

The Forestry Industry must stand on it's own without the subsidy that ETS provides and allows it to outbid and displace farming communities.

Weather events earlier this year and many other times in recent years have graphically shown the huge environmental risk of our current ETS policy, incentivizing pines on steep, erodible land. Downstream effects of which caused massive amounts of pine trees and forestry waste entering water ways and exacerbating flooding, taking out bridges, ruining land and destroying homes. Our beaches have been desecrated, piled high with pine trees, seabed's and fisheries suffocated with silt yet we are still planting pines on steep land unsuitable for forestry, purely driven by the lure of carbon income. Our climate change mitigation policy the ETS is not only not working it is having and will in the future have severe negative environmental and social consequences.

In a warming climate with heightened fire risk why does our climate change policy incentivize planting of this highly flammable species; pinus radiata. Native forests do not have the same fire risk.

Permanent carbon storage in pines is farcical. Currently nearly 90% of our pine logs are exported to China where they are predominantly used as a single use timber for prefabricating concrete buildings then burnt. Woodchips are used to fuel furnaces.

Although many see carbon as a lucrative income stream as a good option it doesn't make it right. The only forest that should be classified as a permanent forest is a native one.

Some Iwi leaders are fighting for the continuation of the carbon income stream from pine plantations we do not think this view represents the wishes of mainstream Maori, particularly those who have been affected by the damage that's been done and will continue to be done to their communities. We should all be looking at the long term view, what will be their income in the future when the carbon income ends.

Current ETS policy delivers short term financial gain for land owners but long term economic and environmental pain for our country.

Long rotation 40 year pine forestry is just carbon farming in disguise, a way to gain an extra 5 years of carbon income over traditional 25 to 30 year rotation The land that many of these forests are being planted on will uneconomic to harvest.

An example of a perverse outcome of the ETS is we are seeing many cut over pine forest blocks are not being replanted because they don't attract carbon income, this is counter intuitive as these blocks are only suitable for forestry and should be replanted, instead they are being left as a wasteland growing wildings and good farmland is planted instead.

New Zealand is a small island nation that survives by selling food to the world, the current ETS scheme is fundamentally flawed as we are incentivizing the planting our precious food producing land which we have a very limited amount at an alarming rate of to offset fossil fuel emissions and we are going to run out of land and export earnings. It is a scheme flawed from the outset.

ETS should incentivize native planting on erodible land and recognize the sequestration of existing pre existing 1989 native bush areas.

Pines must be removed from the permanent forest category.

The ETS settings should be reworked to fund renewable energy projects not pine forests on our precious farmland, we are importing and burning coal from Indonesia to meet an increasing demand for electricity, much of the extra demand coming from plug-in electric vehicles. Use the ETS to fix this situation and produce clean energy.

Passing the buck to councils is not a good option the ETS settings need to be changed.

Lincoln Grant

Enviromentalist

Submission on 'Te Arotake Mahere Hokohoko Tukunga Review of the NZ Emissions Trading Scheme'

Emeritus professor David Norton
Te Kura Ngahere/NZ School of Forestry
University of Canterbury
[redacted]
11 August 2023

My recommendation
I strongly support Option 4 where separate systems are established for incentivising gross emissions reductions and for incentivising emissions removals (carbon sequestration or drawdown). I believe that on both moral and legal grounds this is the only approach that we can take in Aotearoa New Zealand. Option 4 will enable us to meet our global commitments, it will focus on actively reducing gross (rather than net) emissions and will be acceptable to our major trading partners.

Justification
The reality of a global climate crisis driven by anthropogenic greenhouse gas (GHG) emissions is no longer disputed by the scientific community, nor is it something that might occur in the future. It is happening now. Atmospheric CO_2 readings reached 421 ppm in 2022, 150% of the pre-industrial level of 280 ppm, and 2023 will be higher still. As a result, global and local climates are changing rapidly, with new and unprecedented climate events becoming the norm.

While increasing global temperatures are one major outcome of increasing GHG emissions (July 2023 was the warmest month ever recorded globally), it is the increased frequency and intensity of extreme climate events such as rainstorms, heatwaves and droughts that are currently having the biggest impacts on people and the planet.

Aotearoa is no exception: 2022 was the hottest year ever recorded, following 2021, the previous hottest. Already in 2023, across much of northern Te Ika-a-Māui/North Island we've experienced Cyclone Hale and unprecedented rainfall in Tāmaki Makaurau in January, and Cyclone Gabrielle in February - the most significant non-earthquake natural disaster in Aotearoa this century. The impact from the cyclones has devastated communities and landscapes in Tairāwhiti, Wairoa, Hawkes Bay and elsewhere.

The oceans around Aotearoa have also been warmer than normal over the last three years, and southern Te Wai Pounamu/South Island has experienced two extreme marine heat waves (4-6 °C above average) during the 2022/23 summer. It is highly likely that the combination of warmer sea and air temperatures are fueling these more intense rainfall events. While climate-change induced sea level rise has been limited to date, we are also seeing much bigger impacts of king tides, with damage to coastal infrastructure and property.

Internationally, there is widespread political consensus about the need to reduce GHG emissions. But despite international agreements seeking to limit the temperature rise through emissions reductions to no more than 2°C, and ideally only 1.5°C, it seems inevitable that we will exceed 1.5°C during the 21st Century, and perhaps even in 2023, as little progress is being made on meaningful reductions. Furthermore, the question of how to tackle the excess CO_2 already in the atmosphere has barely been addressed.

The New Zealand Emissions Trading Scheme is part of New Zealand Government's response to the Climate Emergency, but it is not working to incentivize reductions in gross emissions. Instead, it focuses on offsetting emissions against sequestration which is a fundamentally flawed approach as this does nothing to stop actual emissions. Further, it incentivizes individuals and companies to make money out of emissions removal (carbon sequestration) in the short-term without any consideration being given to what might happen to this carbon in the long-term. I believe that this approach is morally wrong.

We need a system that actively incentivizes gross emissions reductions while we also need a system that rewards the permanent removal of CO_2 from the atmosphere, whether this be through forests or other methods such as blue carbon. Option 4 in the *Te Arotake Mahere Hokohoko Tukunga Review of the NZ Emissions Trading Scheme* document is the only option that can achieve these two objectives.

Below are some more detailed comments on some of these issues.

Emissions reductions: I believe that there should be a very strong set of financial incentives that actively encourage emissions reductions across all sectors, including agriculture. These incentives should be directly aligned with the 2022 Emissions Reduction Plan (and subsequent plans) with the goal being to eliminate all emissions as much as possible. There will, however, be some emissions that we are unable to eliminate either because there are no current alternatives (e.g. aviation fuel) or because they are essential to our ability to generate income (methane from livestock). In these cases, off-setting through carbon sequestration then becomes a valid part of how we address these.

If we do not tackle gross emissions in this way, we (Aotearoa New Zealand) will be accused of breaching our international obligations and will likely then face barriers to trade especially in agricultural products. We need to show that we are not green-washing and put in place a system that shows we are progressing genuine emissions reductions. Purchase of dubious offshore carbon credits to meet our NDCs does not do this either. We need to reduce gross emissions in Aotearoa.

Emissions removals (carbon sequestration): I believe that there are two situations in which carbon removals through sequestration are valid.

1. Where a company or organisation has an active programme of emissions reductions aiming to transition to renewable energy sources, or where emissions are not reducible beyond a certain point (methane from livestock). In these situations, offsetting of these emissions should be allowed so long as the offset involves a permanent forest. This process should be managed through the emissions removals part of Option 4.

2. Carbon sequestration is also critical to address the CO_2 that is already in the atmosphere and that is causing our current severe weather events like Cyclone Gabrielle. Again, this carbon drawdown needs to involve permanent forests. However, because it is not linked to current emissions, Government needs to establish a separate mechanism to incentivise this, perhaps a mix of historical legacy payments by Government for our past many decades of unsustainable economic activity and through allowing companies who want to be carbon positive, to secure green carbon credits for this.

Both situations create considerable opportunity for private landowners, including Māori, to gain income from the establishment of permanent native forests. I comment in a separate submission on what permanent forests should involve, but in my view, these should be primarily native forests as the sequestration has to be permanent (not for 30 years) and only native forests can guarantee this.

Questions of equity

Reductions in gross emissions raise several key equity issues, as it is those who are already marginalised economically who will find the cost of these measures the hardest to bear. This includes Māori who have been severely marginalised through repeated breaches of Te Tiriti O Waitangi since its signing in 1840. It is my opinion that these issues are best dealt with through a different mechanism than the ETS, with the most equitable approach likely to involve some form of wealth redistribution through new taxation such as wealth tax, capital gains tax or death duties.

Permanent forest category

I have made a separate submission on the permanent forest category. In summary, I argue in this that this category should be restricted to native forests only.

Submission on NZ ETS design and permanent forestry category.

PUBLIC HEALTH COMMUNICATION CENTRE AOTEAROA

11 August 2023

All climate change policy is public health policy.

Climate change is one of the greatest health challenges of the 21st century.[1] Climate change poses both direct and indirect health impacts. An example of a direct impact is extreme temperatures, with an estimated 60,000 plus people in Europe dying from heat-related issues in the summer of 2022.[2] Indirect threats include increased food insecurity and amplified problems from the pollution of freshwater.

It is, therefore, imperative that all climate change policy takes public health risks and potential benefits into account.

This submission is focused on the benefits and risks to public health from climate change, particularly the relative benefits of incentivising indigenous forest restoration over monocultural pine plantations, and how policy makers could better take public health into account.

To date, NZ Government agencies have poorly integrated public health needs into climate policy. Significant impacts to communities' health and well-being from climate change policy can be obscured when the problems policy is aiming to solve are too narrowly defined.

In a report on the human health impacts of climate change, the Royal Society of NZ wrote "[w]ell-designed policies to reduce global greenhouse gas emissions will not only limit climate change and reduce the associated risks to human health but have the potential to improve population health and reduce health inequalities".[3]

Conversely, climate change policies that do not appropriately consider public health can have significant negative direct and indirect impacts. Frequently such impacts are experienced most acutely by communities that are least able to respond due to socioeconomic deprivation and political marginalisation.[4]

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[1]World Health Organization. (2023). The role of the Health Community in Climate Action: taking stock and moving forward. Retrieved from https://www.who.int/news-room/events/detail/2023/05/24/default-calendar/the-role-of-the-health-community-in-climate-action-taking-stock-and-moving-forward

[2] Ballester, J. *et al.* (2023). Heat-related mortality in Europe during the summer of 2022. *Nature Medicine*, doi:10.1038/s41591-023-02419-z

[3] Royal Society Te Apārangi. (2017). Human Health Impacts of Climate Change for New Zealand. Retrieved from https://www.royalsociety.org.nz/assets/documents/Report-Human-Health-Impacts-of-Climate-Change-for-New-Zealand-Oct-2017.pdf

[4] Jones, R. (2019). Climate change and Indigenous Health Promotion. Global Health Promotion, 26(3_suppl), 73-81. https://doi.org/10.1177/1757975919829713

In its current form, the NZ Emissions Trading Scheme (ETS) has not been effective in reducing emissions,[5] nor does it fully realise its potential to protect public (population) health. Considered policy making can take public health into account, supported by the integration of wider government goals and frameworks into the redesign, and achieve significant public health benefits.

Ultimately, the ETS redesign should have as its goal the meeting of the country's international climate change commitments while reaping the public health and social benefits from greater emphasis on the restoration of indigenous forests.

This submission presents:

- implications for public health from climate change
- problems and opportunities for public health from the ETS
- how policy making on the ETS can take public health into account
- specific recommendations on ETS review options
- answers to consultation questions

We welcome this opportunity for to review of ETS settings and ask of policymakers to choose policy options that best reduce greenhouse gas emissions and support the health and well-being of communities, not only in the present but over coming generations.

About the Public Health Communication Centre

The Public Health Communication Centre (PHCC) is an independently funded organisation dedicated to increasing the reach and impact of public health research in Aotearoa New Zealand. The Centre has a range of public health and science communication experts, and the Director is Prof Michael Baker.

We are hosted by the Department of Public Health at the University of Otago Wellington. The PHCC identifies and promotes opportunities to improve public health, equity, and sustainability, and communicate these ideas effectively to the public, media, and decision-makers.

Authors and contact details

This submission was prepared by Research Fellow Marnie Prickett, Professor Nick Wilson, Professor Simon Hales, and Communication Lead Adele Broadbent (links to access full bios). We would be very keen for any opportunities to verbally present our views to inquiry staff/policy-makers.

Please direct any queries to [redacted]

[5] Climate Change Commission. (2023). Executive Summary: Advice on NZ ETS unit limits and price control settings for 2024-2028. Retrieved from https://www.climatecommission.govt.nz/our-work/advice-to-government-topic/nz-ets/our-advice-on-the-nz-ets/nz-ets-unit-limits-and-price-control-settings-2024-2028/executive-summary-advice-on-nz-ets-unit-limits-and-price-control-settings-for-2024-2028/

Public health and climate change

In 2017, the Royal Society Te Apārangi summarised the evidence relating to the impacts of climate change on health.[6] Their report identified the direct and indirect impacts of climate change on public health that we include in brief below. We refer to their work as a useful summary.
Please note, however, there is far more literature available on the public health implications of climate change. The Lancet, for example, produced a high-quality, comprehensive report on health and climate change in 2020.[7]

Our researchers can further support climate policy makers to reach sound public health decisions by identifying and synthesising relevant literature.

Direct impacts on public health from increased global greenhouse gas emissions:

- Increased climate extremes: storm severity and flooding, droughts (and fires) and related infrastructure damage
- Displacement of homes and whole communities from climate-related disasters
- Extreme temperatures

Indirect impacts on public health from increased global greenhouse gas emissions:

- Crop damage with impacts on food availability, quality, and safety
- Harmful algal blooms impacting water supply and recreational use of waterways
- Microbial contamination (water and food)
- Mental health and well-being impacts from climate-change disasters and other disruptions
- Poorer outdoor air quality from fires
- Impacts on infectious disease risk (eg, vector-borne diseases)

Public health and ETS

In its current form the ETS results in an imbalance between promoting the restoration of indigenous forests and promoting plantation forestry. However, redesigned to put a high carbon price on restoring indigenous forests (relative to the carbon price on plantation forests) it could achieve a wide range of health and other co-benefits.

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[6] Royal Society Te Apārangi. (2017). Human Health Impacts of Climate Change for New Zealand. Retrieved from https://www.royalsociety.org.nz/assets/documents/Report-Human-Health-Impacts-of-Climate-Change-for-New-Zealand-Oct-2017.pdf

[7] Watts, et al. (2021). The 2020 report of The Lancet Countdown on health and climate change: responding to converging crises. The Lancet, 397(10269), 129-170. https://doi.org/https://doi.org/10.1016/S0140-6736(20)32290-X

The problems with incentivising plantation pine forests over indigenous forest restoration

Current ETS settings have incentivised the planting of monocultural pine plantations. This has had some benefits in terms of extracting carbon from the atmosphere and providing jobs for forestry workers – often in economically-deprived regions. However, compared to indigenous reforestation it has the following disadvantages:

- The carbon stored in exotic plantation forests is less secure in the long term than in indigenous forests. Trees like pines "may sequester carbon quickly for the first 20 years, but 10 years later they're cut down and most of the carbon is dispersed and lost."[8] That is because wood and paper can be burnt in wood burners releasing the carbon back to the atmosphere; or newspaper rots in garbage dumps releasing methane.

- Relative to indigenous reforestation, monocultural exotic plantations can increase erosion and soil loss (particularly after trees have been harvested).[9] A July 2023 report produced for the Ministry for the Environment by Manaaki Whenua found standing exotic forests were less effective in erosion control than indigenous forest during Cyclone Gabrielle.[10] Along with forestry slash, soil lost during flooding can increase the damage to crucial public health infrastructure, like drinking and wastewater facilities.[11] Soil deposited on the land after such flood events can be a public health risk. It may contain contaminants and, as it dries, can cause respiratory and other health issues.[12]

- Monocultural forestry plantings can disrupt water cycles. As a 2020 Nature article notes:

  "The short-term gains for climate mitigation delivered by planting swaths of uniform trees for carbon storage may be offset by the long-term losses caused by the hydrological consequences of lower resilience to environmental disturbances. For example, plant uniformity in agricultural landscapes that have replaced wetlands has been linked to increases in flood and drought frequencies and magnitudes, and deterioration of water quality, both of which place people at risk. Furthermore, plant uniformity in forested areas has been linked to changes in precipitation recycling by altering the balance between local water storage and runoff and the contribution of evaporation within a region to precipitation

[8] Country Life. (2022). Indigenous Forest and Carbon. Radio New Zealand. https://www.rnz.co.nz/national/programmes/countrylife/audio/2018847934/indigenous-forest-and-carbon

[9] Ministerial Inquiry into Land Uses in Tairawhiti and Wairoa. (2023). Outrage to optimism: Report of the Ministerial Inquiry into land uses associated with the mobilisation of woody debris (including forestry slash and sediment in Tairāwhiti /Gisborne District and Wairoa District. https://environment.govt.nz/assets/Outrage-to-Optimism-CORRECTED-17.05.pdf

[10] McMillan, A., Dymond, J., Jolly, B., Shepherd, J., & Sutherland, A. (2023). Rapid assessment of land damage – Cyclone Gabrielle.

[11] Laing, D. (2023). Hawke's Bay Today. https://www.nzherald.co.nz/hawkes-bay-today/news/wastewater-still-a-battle-for-napier-city-council/J63Y63T3PFCDVL5ROUXNMZOI7U/

[12] Hawke's Bay Today. (2023). Cyclone Gabrielle: Health warning issued over dust, floodwaters. Hawke's Bay Today. https://www.nzherald.co.nz/hawkes-bay-today/news/cyclone-gabrielle-health-warning-issued-over-dust-floodwaters/AWKTYXVWCJDWVLY5WPGSEZ3PDY/

elsewhere — with different consequences in different climatic zones for both downstream and downwind water supplies utilized by people. Yet current international policymakers often consider forests largely in terms of the carbon cycle without consideration of the implications for the water cycle".[13]

This homogenisation of hydrological functions can contribute to increased flood and drought risk, where less water may be absorbed and stored in soil and underground, and more water may be lost through processes like evaporation. Additionally, research from New South Wales identified negative effects on mental health as an important health consequence of flooding.[14]

- Monocultural pine plantations are more susceptible than indigenous forests to wildfire.[15] Wildfires have direct and indirect risks to people's health. As Leverkus, et al, write:

  "Strategies to combat climate change through tree planting—whether through plantations or through restoring native vegetation— should address how the changes in composition and configuration of landscapes can affect fire propagation. Plans should favor landscape mosaics, heterogeneous and fragmented stands rather than large and homogeneous ones, vertical vegetation discontinuities that prevent surface fires from spreading to crowns, high species diversity, low-flammability species, and low plant densities throughout the life span of planted trees. In addition, decisions about which tree species to plant should prioritize natural resilience to future fires, which are likely to occur at large spatial and temporal scales under warming conditions. In many places, native resprouting species would meet these criteria".[16]

  This susceptibility to fires also degrades the long-term carbon capture of plantation forests relative to indigenous forests.

Opportunities for public health and other co-benefits from a redesigned ETS

A redesigned ETS that puts a high carbon price on restoring indigenous forests relative to that for planting exotic plantation forests could have a wide range of benefits. These include:

[13] Levia, D. F., et al. (2020). Homogenization of the terrestrial water cycle. Nature Geoscience, 13(10), 656-658. https://doi.org/10.1038/s41561-020-0641-y

[14] Lee, G. W., Vine, K., Atkinson, A.-R., Tong, M., Longman, J., Barratt, A., Bailie, R., Vardoulakis, S., Matthews, V., & Rahman, K. M. (2023). Impacts of Climate Change on Health and Health Services in Northern New South Wales, Australia: A Rapid Review. International Journal of Environmental Research and Public Health, 20(13), 6285. https://www.mdpi.com/1660-4601/20/13/6285

[15] Barquín, J., Concostrina-Zubiri, L., Pérez-Silos, I., Hernández-Romero, G., Vélez-Martín, A., & Álvarez-Martínez, J. M. (2022). Monoculture plantations fuel fires amid heat waves. Science, 377(6614), 1498-1498. https://doi.org/doi:10.1126/science.ade5923

[16] Leverkus, A. B., Thorn, S., Lindenmayer, D. B., & Pausas, J. G. (2022). Tree planting goals must account for wildfires. Science, 376(6593), 588-589. https://doi.org/doi:10.1126/science.abp8259

- Avoiding the above listed problems with plantation forests (ie, via indigenous forests having more secure long-term carbon storage; better erosion prevention; no forestry slash; less pressure on infrastructure; more resilience to drought and flooding; and reduced wildfire risk).

- Improved biodiversity and buffering from climate change impacts. Diverse landscapes and healthy ecosystems support biodiversity and increase resilience to the impacts of climate change. Scholars have identified a "vicious cycle" whereby ecosystem degradation drives climate change drives increased disaster risk which in turn drives ecosystem degradation. [17] Well-designed policy can drive the reverse cycle (fig. 1).

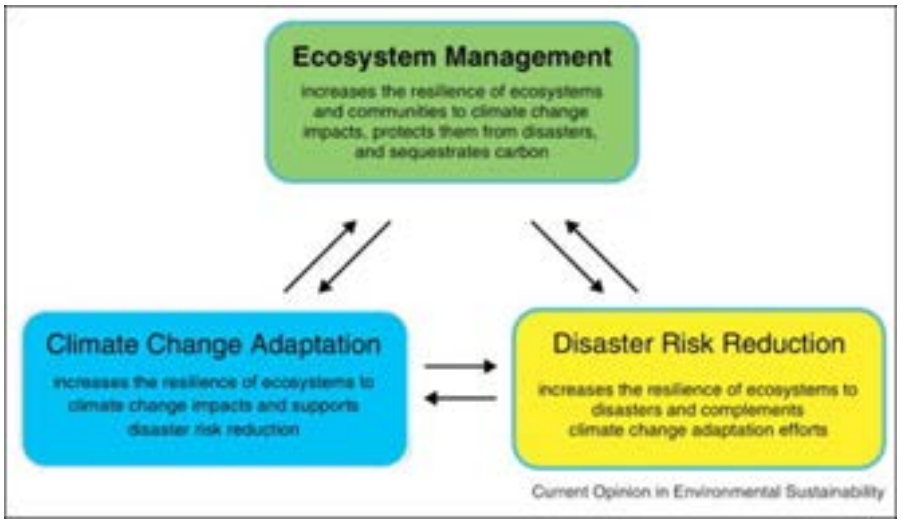

Figure 1: Simplified illustration of the complicated interactions between climate change, ecosystem degradation and increased disaster risk (Source: Munang, et al. (2013))

- Drinking water source protection. The Government inquiry into the contamination of Havelock North's drinking water emphasised, "protection of the source of drinking water provides the first, and most significant, barrier against drinking water contamination and illness".[18] An ETS that encourages permanent native forest restoration could have the co-benefit of improved drinking water source protection.[19] Source water protection reduces contamination risks to people's drinking water and can reduce costs associated with the treatment of drinking water supplies.

[17] Munang, R., Thiaw, I., Alverson, K., Liu, J., & Han, Z. (2013). The role of ecosystem services in climate change adaptation and disaster risk reduction. Current Opinion in Environmental Sustainability, 5(1), 47-52. https://doi.org/https://doi.org/10.1016/j.cosust.2013.02.002

[18] Government Inquiry into Havelock North Drinking Water. (2017). Report of the Havelock North Drinking Water Inquiry: Stage 2. https://www.dia.govt.nz/Report-of-the-Havelock-North-Drinking-Water-Inquiry---Stage-2

[19] Abell, R. *et al.* Freshwater biodiversity conservation through source water protection: Quantifying the potential and addressing the challenges. *Aquatic Conservation: Marine and Freshwater Ecosystems* **29**, 1022-1038, https://doi.org/10.1002/aqc.3091 (2019).

- Mental health and wellbeing benefits, both in terms of reduced risk of high impact events on mental health and in terms of access to the natural world. Connection to a healthy environment provides mental health benefits and is likely to be particularly important for Māori. [20] Access to native plants for traditional treatment of health conditions (rongoā) is also a benefit of indigenous forests. The ETS redesign needs to account for and not worsen socioeconomic disadvantages experienced by Māori. [21]

What we suggest is compatible with international calls to focus more on indigenous forest restoration rather than plantation forestry in response to climate change.[22] Additionally, models are already being developed for how we might transition poorly placed existing pine plantations to indigenous forests.[23] There may also be a case for expanding this approach (of applying a high carbon price in a reformed ETS) to the protection and restoration of wetlands and estuaries. These store significant quantities of carbon and are important for biodiversity.

Additionally, central and local government (under the National Policy Statement for Indigenous Biodiversity) as well as communities' biodiversity goals could be better supported by a redesigned ETS and permanent forest category.

How policy making on ETS can take public health into account

To date, it appears that public health has not been considered in policy making with regards to the ETS. Our brief review of previous ETS Regulatory Impact Statements suggests this is likely the case. While limited, we commend the Ministry's acknowledgement of the public health impacts of climate change and ETS decisions on public health in the consultation document.

This acknowledgment can be formalised in the ETS policy making process in its redesign and supporting documents.

- Regulatory Impact Statements (RIS) prepared for climate policy must address public health risks (costs) and opportunities (benefits).

  RIS template guidance recommends the following dot pointed issues are covered. Done well, covering them would support decision making that takes public health into account. The dot

[20] Ewing, I. Push for Government to permanently halt planting exotic trees and restore native forests. *Newsroom* (2023). <https://www.newshub.co.nz/home/politics/2023/07/push-for-government-to-permanently-halt-planting-exotic-trees-and-restore-native-forests.html>.
[21] Jones, R. (2019). Climate change and Indigenous Health Promotion. Global Health Promotion, 26(3_suppl), 73-81. https://doi.org/10.1177/1757975919829713
[22] Lewis, S. L., Wheeler, C. E., Mitchard, E. T. A. & Koch, A. Restoring naural forests is the best way to remove atmospheric carbon. Nature 568, 25-28, doi:10.1038/d41586-019-01026-8 (2019).
[23]

pointed issues below are intended to inform the problem definition, ensuring it is not limited to the technical details but encompasses public health needs. A problem definition that does not include public health will obscure from decision makers the significant impacts to communities' health and well-being from climate change and poor land use.

- **'Government regulatory failure** – where there are unintended consequences resulting from the **design** or **implementation** of existing regulation (eg, outcomes misaligned with the original policy intent)'

  Example*: The unintended consequences of risks to public health under climate change from monocultural pine plantations could be significant, including risks to infrastructure, human health and environmental health.*

  Outcomes are misaligned with original policy intent as gross emissions have not been substantively reduced.

- **'Equity issues** – where the impacts of current arrangements fall disproportionately on certain groups and require fairer distribution'.

  Example*: Climate change risks and impacts, including public health impacts, disproportionately affect lower socioeconomic groups and marginalised communities.*

- **'Behavioural problems** – where cognitive biases (eg, confirmation bias, optimism bias, status quo bias, the availability heuristic, etc.) can lead to distorted incentives and poor decision-making'.

  Example*: Current settings incentivise monocultural pine plantations that may increase climate change risks to communities, including from flooding, drought, wildfire, damaged infrastructure, etc.*

- **'Externalities** – where impacts fall on people other than those who use a good/service which can lead to its over- or under-provision.'

  Example*: NZ ETS pine plantations may be owned by individuals and companies that do not experience the localised impacts and risks from monocultural plantations under climate change (eg, downstream damage of homes or infrastructure from silt and/or forestry slash).*

- Treasury's Living Standards Framework should be integrated into policy making and the RIS. The ETS RIS objectives should link to the Living Standards Framework and He Ara Waiora and be consistent with the multi-dimensional approach to well-being.

  An ETS and permanent forestry category that incentives and supports the regeneration of indigenous forests could include benefits the Living Standards Framework indicators.

- environmental amenity (access to natural environment, drinking water opportunities, drought, swimmability),
- health (being in good physical and mental health)
- safety (being safe from harm and the fear of harm)
- sense of belonging (ability to express identity)

Importantly, a policy that undermines public health or increases risks for communities from climate change would not be consistent with the framework or He Ara Waiora.

Specific recommendations on ETS review options

To obtain improved long-term carbon storage and to achieve a range of health and other co-benefits, the reformed ETS and permanent forestry category redesign should incentivise the restoration of indigenous forests ahead of plantation forestry. Our recommendations are made in order to support this outcome.

Option 1: Decrease the amount of emissions units so that the carbon price rises

Recommendation: We strongly support this option, along with some of the other options (see below). The carbon price in the ETS is currently far too low given the need for the country to efficiently meet its international commitments and to play its fair role (given its historically high greenhouse gas emissions as a high-income country).

However, any adverse impact on low-income New Zealanders should be addressed with appropriate other adjustments (eg, lowering income taxes for those on lower incomes and/or improving social welfare benefits and supports).

Option 2: Increase the demand for emissions units by allowing the Government and/or overseas buyers to purchase them

Recommendation: We support both the NZ Government and overseas buyers being able to purchase emissions units. A first step might be to permit only Australian buyers – and if that works well (after a 1-year review) to then consider allowing other buyers (eg, from other OECD countries). Ultimately, it is highly desirable to have a functional international market in carbon – given the international nature of the climate change crisis.

Option 3: Restrictions or conditions are placed on removal activities

Recommendation: We do not have a clear view on extra restrictions/conditions. It is ideal that more indigenous forest is planted (or allowed to regenerate), but there might also be a case for additional plantation forest in some appropriate localities (eg, where it replaces erosion-prone farmland and where the forestry slash problem can be avoided).

Option 4: Emitters will not be able to purchase NZUs from foresters to pay for their greenhouse gas emissions

Recommendation: Emitters should still be allowed to purchase NZUs. It seems optimal for forest planting (and allowing indigenous forest to grow) to be stimulated by the market price of carbon.

Answers to consultation questions

ETS

1. Does the NZ ETS need to be able to drive emissions reductions in transport, energy and waste?

   Answer: Yes, absolutely. These are all areas with high emissions, eg, high ETS prices on transport fuels will help drive a shift to electric vehicles and to public transport (with public health benefits from reduced air pollution etc).

2. Does the NZ ETS need to be able to drive emissions removals from activities like forestry?

   Answer: Yes, absolutely. Forests (especially indigenous forests) are a good way to remove carbon and have numerous co-benefits (eg, preventing erosion and protecting water quality).

3. If emissions reductions are to be prioritised in the NZ ETS, how could the scheme be changed to achieve this?

   Answer: The priority for emissions reductions in NZ must be to bring agriculture fully into the ETS – with appropriate charges for methane and nitrogen emissions. (Eg, carbon charges on milk and ruminant meat, as well as on fertiliser). At present the design of the ETS is extremely unfair – as it ignores approximate half of the emissions (which are from agriculture).

Permanent forest category

1. What should be allowed to register as permanent forest?

Answer: Indigenous forests that are owned by the state and private owners – with a minimum size of some number of hectares (to avoid excessive administrative costs). It might be desirable for relevant government departments to get carbon credits given to them eg, if the Department of Conservation is able to buy up indigenous forest currently in private hands.

2. If the permanent forest category includes transition forests, how should transition forests be managed to: a. ensure they transition from exotic to indigenous, and b. reduce the financial risks to participants.

   Answer: Putting a high ETS price on indigenous forest development – even at the start of the transition is probably desirable.

3. What rules and compliance regime will best maximise the positive outcomes from permanent forests, while minimising their risks?

   Answer: Consideration could be given to requiring minimal levels of pest control to achieve the full carbon price for indigenous forests (eg, minimal ongoing controls on possums, deer, goats, and pigs). Possibly indigenous forests in watersheds used for urban water supplies could be given extra ETS pricing values.

‘Review of the NZ ETS’ (MfE) and

‘A redesigned NZ ETS Permanent Forest Category’ (MPI)

Greater Wellington Regional Council responses

Timeframe and supporting documents

Consultation opens: 19 June 2023

Consultation closes: 11 August 2023

Make a quick submission: etsconsultation@mfe.govt.nz

Review of the NZ ETS:

- NZ ETS review: Consultation now open | Ministry for the Environment
- Consultation document: Review of the NZ ETS

A redesigned NZ ETS Permanent Forest Category:

- A redesigned NZ ETS Permanent Forest Category - Ministry for the Environment - Citizen Space
- Consultation document: A redesigned NZ ETS Permanent Forest Category

Questionnaire - Review of the NZ ETS

Chapter 2: Expected impact of current NZ ETS

2.1. Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

☒Yes

☐No

☐Unsure

Please explain your answer here

We note that uncertainty regarding ETS settings caused by this consultation and other factors may discourage the planting of exotic carbon forests and reduce the anticipated 'oversupply' of NZUs from this source.

2.2. Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

Please write your answer here

-

2.3. Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

Please write your answer here

-

2.4. Do you agree with the summary of the impacts of exotic afforestation?

☐ Yes

☐ No

☒ Unsure

Please explain your answer here

The table describes both advantages and disadvantages of permanent exotic forests, but the framing of 'challenges' is negative. Erosion reduction, flood regulation and water quality, as well as making a return from otherwise unproductive land, are all important co-benefits that exotic forests can bring and these need to be emphasised. Also the risk of 'wilding' trees depends on the exotic species in question. The actual level of harm that could arise from unmanaged 'plant and leave' exotic forests in Aotearoa NZ is not well understood, and clearly a more informed and critical estimate of these impacts is needed to help guide these decisions about the ETS and land use.

Furthermore, the risks and benefits from permanent exotic afforestation should not be evaluated exclusively against each other, but also against that of the other options for the land in question.

Chapter 3: Driving gross emissions reductions through the NZ ETS

3.1. Do you agree with the case for driving gross emissions reductions through the NZ ETS?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here - In your answer, please provide information on the costs of emissions reductions.

We strongly agree that the NZ ETS should be restructured to provide a strong tool to drive gross emissions reductions, noting that the current settings of the NZ ETS mean it has not achieved meaningful gross emissions reductions. Reducing gross emissions must be the first priority, only allowing for carbon removals to offset emissions from hard-to-abate sectors. We agree that relying heavily on removals/offsets will delay people taking actions that reduce gross emissions, lead to higher cumulative emissions and push the burden of addressing gross emissions onto future generations.

Therefore, the NZ ETS needs to be reviewed and supplemented by complementary policies (e.g., carbon cost border adjustment measure, policies to reduce the current stockpile, a faster phase out of free industrial allocations, align the NZ ETS with the carbon budgets, etc.)

3.2. Do you agree with our assessment of the cost impacts of a higher emissions price?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here

3.3. How important do you think it is that we maintain incentives for removals?

Please write your answer here

Removals will play a decisive role in achieving Aotearoa New Zealand's future Nationally Determined Contributions (international emissions reduction pledges under the Paris Agreement), if not the one for 2030. Therefore, Greater Wellington thinks that maintaining incentives for removals is very important but should not come at the expense of efforts to reduce gross emissions. Removals should only cover the portion of hard-to-abate New Zealand Aotearoa's emissions. A means to maximise both gross emissions reduction and those removal activities that are beneficial in both the short term and long term is needed. It is important that incentives for removals be

broadened to incentivise removals by a wider range of ecosystem types, with co-benefits for indigenous biodiversity, climate adaptation and resilience.

Chapter 4: Changes to the NZ ETS would be significant for Māori

4.1. Do you agree with the description of the different interests Māori have in the NZ ETS review?

☐ Yes

☐ No

☒ Unsure

Please explain your answer here

Māori have a wide range of interests linked to the NZ ETS (e.g. forestry for its economic value on Māori land and providing employment). Our mana whenua/tangata whenua partners have also told us that they would like to see the ETS drive an increase in indigenous forest and protection of other ecosystems, in particular wetlands. Therefore, it is of major importance that the New Zealand government upholds its Te Tiriti obligations and meaningfully engages with Māori to carefully manage potential impacts of the NZ ETS in the short, medium and long-term. Greater Wellington also recommends co-designing the changes to the NZ ETS with Māori to better provide for their interests.

4.2. What other interests do you think are important? What has been missed?

Please write your answer here

-

4.3. How should these interests be balanced against one another or prioritised, or both?

Please explain your answer here

-

4.4. What opportunities for Māori do you see in the NZ ETS review?

Please write your answer here

There are significant risks for Māori, in that this review may deprive them of a way to make a return from their lands, lands that typically have been returned to them in a degraded state compared to when they were taken. This review is an opportunity for a 'course correction' where better outcomes for both Māori and Te Taiao can be achieved.

Providing appropriate settings to incentivise the restoration of indigenous ecosystems with co-benefits for carbon removals and indigenous biodiversity. This will contribute to the aspirations expressed by our iwi partners, recognising the critical interconnection of climate change and

indigenous biodiversity. This will also provide opportunities for employment of iwi in restoration projects to improve the health and well-being of their local environment.

If any, how could these be realised? Please explain your answer here

A right tree, right place approach is needed, one that recognises the practicalities of long-term land management, economic limitations and Mātauranga Māori. ETS settings should provide greater incentives for removals that have co-benefits for environmental, cultural and social values.

Chapter 5: Objectives and assessment criteria

5.1. Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals?

☒ Agree

☐ Disagree

☐ Unsure

Please explain your answer here

See question 3.3.

5.2. Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow?

☒ Agree

☐ Disagree

☐ Unsure

Please explain your answer here

In order to keep global warming under the 1.5˚C threshold, we must decarbonise our societies as quickly as possible. This may avoid dramatic changes in the climate which would have critical impacts. However, the transition to a low carbon economy/society needs to be fair, inclusive, and equitable, otherwise it will lose popular support and falter.

5.3. Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term?

☐ Agree

☐ Disagree

☒ Unsure

Please explain your answer here

The NZ ETS could drive that level of abatement – as the analysis shows. The question is: should it, given the other likely consequences? A market mechanism like the NZ ETS which rewards only maximum emissions reduction or removal achieved at minimum cost will not incentivise actors to pursue much more costly and high-maintenance options such as native reforestation. An ETS-like market environment may motivate landowners to pursue moderately more expensive options such as planting long-lived species with 'light' long term management obligations, assuming that more lucrative, simpler options are not available.

Introducing planning rules regarding what kind of forests can be planted where may help avoid some negative environmental outcomes, but not necessarily motivate actors to pursue better ones. For example, if a bare, erodible hillside was prohibited from having exotic forests planted on it, it doesn't mean that anyone will plant a native forest instead (especially if the incentives are insufficient).

5.4. Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation?

☒ Agree

☐ Disagree

☐ Unsure

Are there any you consider more important and why? Please provide any evidence you have

Greater Wellington commends the government for the primary assessment criteria and key considerations used in the NZ ETS review. The criteria of distributional impacts, giving effect to Te Tiriti and co-benefits are especially important and should be significant weighting. Options should be compared to the counterfactual scenario where millions of hectares of our unproductive, steep, erosion-prone land remain bare.

We would like to see the primary criteria include an expression that achieving additional gross emissions reductions should be prioritised over incentivising removals.

Key consideration "Supports co-benefits" should specifically prioritise indigenous biodiversity and freshwater benefits, recognising the significant concerns over the current state of both indigenous biodiversity and freshwater and the risk posed by climate change to both of these.

5.5. Are there any additional criteria or considerations that should be taken into account?

Please write your answer here

-

Chapter 6: Options identification and analysis

6.1. Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

☐ Option 1

☐ Option 2

☐ Option 3

☒ Option 4

6.2. Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5?

☒ Agree

☐ Disagree

☐ Unsure

Please explain your answer here and provide any evidence you have

6.3. Of the four options proposed, which one do you prefer?

☐ Option 1

☐ Option 2

☒ Option 3

☐ Option 4

Please explain your answer here

Option 1 and option 2 will not be able to achieve the objectives set up by the Government (prioritise gross emissions reductions and maintain support for removals), especially in the medium and long term. Option 3 and option 4 are similar and will be able to achieve the objectives if they are supplemented by complementary policies. Option 4 affords the government the highest degree of control over afforestation incentives. But Greater Wellington understands that option 3 requires a degree of change that is lower than option 4 and is faster to implement. Therefore, in order to speed up the NZ ETS review implementation, which has already caused significant disruption to the NZU market and foresters planting plans, we recommend the adoption of option 3.

6.4. Are there any additional options that you believe the review should consider? Why?

Please write your answer here

Due to the degree of uncertainty of the options proposed in the discussion document, including for option 3 which is Greater Wellington's preferred option, Greater Wellington recommends putting in place and implementing complementary policies to ensure that objectives are met in due time (e.g. a carbon cost border adjustment measure, policies to reduce the current stockpile, faster phase out of industrial allocations, align the NZ ETS with the carbon budgets, etc).

6.5. Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

Please write your answer here

Greater Wellington agrees with the expected impact of option 3.

Moreover, we would like to emphasize the fact that Regional Councils are a landowner and as such have interest implications in the NZ ETS.

As an example, Greater Wellington owns carbon credits gifted to it by government for our pre-1990 forests and, by borrowing against them, has implemented a Low Carbon Acceleration Fund. This fund was established to accelerate the action required for Greater Wellington to meet its ambitious climate goals and has allowed us to implement an ambitious native forest and wetland restoration plan in our regional parks without significantly impacting rates. However, Greater Wellington finds itself in a position where this fund is currently not available for additional decarbonisation projects due to the significant NZU price drop that began at the end of 2022.

This is why Greater Wellington would like to highlight how important it is for the government to make sure the price of NZUs from forestry do not drop dramatically 'overnight'. While we recognise the need for more gross emissions reduction, we also encourage the government to 'grandparent' the rules for any permanent exotic forests that have been registered in the ETS or the Permanent Forest Sinks Initiative and any forestry NZUs that have already been issued. To do otherwise would have a direct negative impact on council's asset values and consequently its decarbonisation programme.

Greater Wellington also supports the CCC recommendation to invest directly in Iwi/Māori to lead climate action. The leadership of Iwi/Māori is critical to our climate change response.

6.6. Do you agree with the assessment of how the different options might impact Māori?

☐ Agree

☐ Disagree

☒ Unsure

Which are the most important? Write your answer here

See question 4.1.

Chapter 7: Broader environmental outcomes and removal activities

7.1. Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here

Greater Wellington is concerned about social and economic influences of carbon forestry taking up valuable farmland, and the threat that carbon forests could someday be cleared or damaged and thereby cause a wide range of negative impacts. We are particularly concerned about the impact of widespread and unplanned exotic forestry on our rural communities and environment and our

ability as a region to produce food. Regulations protecting the best land for food production from being converted to other uses like forestry, industry and housing are needed. Greater Wellington recognises that significant afforestation, using both indigenous forests and exotic forests, is required to meet New Zealand's climate change targets. However, indigenous forests can continue to sequester carbon for hundreds of years and provide a range of associated ecosystem, cultural and social benefits. Creating the right conditions for large-scale native planting is challenging. More needs to be done to enable and incentivise establishment and regeneration of native forests, and fund critical browser pest control. This is likely to require funding, research, and policy interventions beyond the NZ ETS. Regional authorities rely on partnerships with private landowners and investors to deliver planting programmes: if native reforestation is to occur on a significant scale, it needs to be made financially viable, which is likely only to be possible through significant public subsidies or direct investment.

7.2. If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

Please write your answer here

Option 3 and 4 provide the greatest opportunity to support co-benefits. However, as mentioned earlier, the NZ ETS itself will not be sufficient to bring the level of co-benefits which are desirable and complementary policies will be needed to address this.

7.3. Should a wider range of removals be included in the NZ ETS?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here

Greater Wellington encourages the government to add other ecosystems, such as wetlands and coastal ecosystems (e.g., saltmarshes and mangrove swamps), to the NZ ETS, if the emissions removals can be estimated with reasonable accuracy, and provided the methane emissions from wetlands are adequately recognised.

Healthy natural ecosystems, such as wetlands, also provide significant co-benefits, especially for the indigenous biodiversity, but also cultural benefits for Māori, and can provide resilience to climate change and natural hazards.

7.4. What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

Please write your answer here

If well-designed and aligned with other policies (such as the NZ ETS), biodiversity credits could be an effective way to reward co-benefits.

Provide general feedback

Any general feedback on the consultation

Add your comments, ideas, and feedback here

-

Upload supporting documentation

Is this submission for both the NZ ETS review and redesign of the permanent forest category consultations?

☒ Yes

☐ No

Questionnaire - A redesigned NZ ETS Permanent Forest Category

Section 3: Timeframes and other related work by the government

1. How do you think the Inquiry's recommendations should be reflected in proposals to redesign the permanent forest category?

Greater Wellington agrees with the fact that the Inquiry's recommendations should be reflected in proposals to redesign the permanent forest category. This would allow co-benefits such as environmental, social, cultural and economic benefits.

Section 7: We want the redesigned permanent forest category to achieve multiple outcomes

2. Do you agree with our assessment criteria for the redesigned permanent forest category?

☒ Yes

☐ No

☐ Unsure

If no, what would you change and why? Please explain your answer here.

Greater Wellington agrees with the assessment criteria which would ensure multiple co-benefits such as environmental, social, cultural and economic benefits.

3. Do you think any of these criteria are more important than the others?

If so, which criteria and why? Please explain your answer here.

Regional councils are land managers as well as environment managers. As such, providing positive environmental outcomes is of high importance for Greater Wellington. Moreover, environmental outcomes very often are linked to other positives outcomes (resilience towards climate hazards, enhanced cultural and social values, etc).

Section 9: Design choice 1 – Which forests should be allowed into the permanent forest category?

4. Of these options, what is your preferred approach?

Note, options 1.2a and 1.2c are not mutually exclusive.

☐ Option 1.1

☒ Option 1.2

☐ Option 1.2a

☐ Option 1.2b

☐ Option 1.2c

Why? Are there other options you prefer, that we haven't considered? Please explain your answer here.

Greater Wellington is supportive of option 1.2: exotic forests allowed to enter under limited circumstances.

Greater Wellington views are that targeted exotic species exceptions that will accelerate the reduction of erosion risk should be included into the permanent forest category. Exceptions could also provide for permanent exotic forestry of a range of exotic species (e.g. Pine, Eucalyptus, Douglas Fir, Redwood, etc.) all of which could have beneficial, long-term use in some catchments, as well as significant carbon storage potential.

5. If you support allowing exotic species under limited circumstances, how do you think your preferred 'limited circumstance' should be defined?

For example, if you support allowing long-lived exotics to register, how do you think we should define 'long-lived'?

Please explain your answer here.

We are unable to give detail at the moment but suggest that MPI develop these criteria with a public evidence-gathering phase, possibly followed by a public consultation. It should also maintain a list of approved exotic species. Key considerations include ability to stabilise land/root structure, wilding risk and support for biodiversity.

6. Do you think there is an opportunity to use permanent forests to stabilise erosion-prone land?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here.

The definition for highly erodible land used by MFE/Stats NZ is "Land at risk of severe mass-movement erosion if it does not have a protective cover of deep-rooted woody vegetation". Therefore, it follows that highly erosion prone land should be returned to a deep-rooted woody vegetation cover. Greater Wellington considers that permanent forest should be prioritised on highly erodible land and that central government policies should align to promote and support this, including by using the ETS settings.

7. Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here.

As long as there are useful exotic species with low wilding risk that could be used, then it would be perverse to incentivise further plantings of species that risk increasing the wilding issue.

Section 10: Design choice 2 – How should transition forests be managed to ensure they transition from exotic to indigenous forests and reduce the financial risks to participants?

8. Do you agree with the proposal for a specific carbon accounting method for transition forests?

Note: we are not seeking feedback on the details of the specific accounting values now – if Option 2 is chosen, we will consult on the design of the regulations at a later date.

☒ Yes

☐ No

☐ Unsure

If you disagree, could you please provide the reasons why? If there are other options you think we should consider please list them. Please explain your answer here.

-

9. If you agree with the proposal for a specific carbon accounting method for transition forests, what do you think it needs to achieve?

Please explain your answer here.

Greater Wellington agrees with the fact that new mandatory specific carbon accounting methods for transition forests in the permanent forest category is needed to prevent a possibly significant surrender liability. However, Greater Wellington has concerns regarding relying on the ETS to establish transition forests and indigenous forests. Indeed, the return on investment is currently very low (high planting costs as well as maintenance costs such as pest management and low revenue from NZUs due to low sequestration rate) and these two types of forests require long-term management to reach the desired mature end-state. Transition forests require a complicated process to be executed between 50-100 years after the first generation of exotic planting to transition to native species. It is difficult to judge whether the sale of the exotic logs during this stage would justify the effort involved, assuming the terrain even allowed for their removal. Very few businesses / farmers / landowners, will engage in an activity that is not cost-effective in the short to medium term.

10. What do you think should occur if a forest does not transition from a predominately exotic to indigenous forest within 50 years?

Please explain your answer here.

We have concerns regarding who can be held responsible in case of a failed transition or if no attempt to execute a transition is made by the forest owner. Compelling them to engage in a

complicated and costly process that they have no interest in is unlikely to have good outcomes. The other approach (which is not mutually exclusive) is the government intervenes by providing further incentives in the form of funding and practical support. However, providing this creates a moral hazard for the forest owner to let things go wrong and have the government sort it out for them.

It seems unavoidable that if the government wants to see indigenous forest to be restored on a large scale it should be directly involved, rather than trying to rely on the private sector and market mechanisms to deliver this outcome.

We find it odd that transition forests on private land are being put forward by MPI as a better option than permanent exotic forests on private land when there is no evidence that they can be carried out successfully, or that they carry lower risk overall of resulting in unwanted environmental outcomes.

Section 11: Design Choice 3 — How should permanent forests be managed?

11. Of these options, what is your preferred approach?

Note, options 3.2 and 3.3 are not mutually exclusive.

☒ Option 3.1

☐ Option 3.2

☐ Option 3.3

Why? Are there other options you prefer, that we haven't considered? Please explain your answer here.

As it states in the document, it is difficult to identify what the best approach might be given that the NES-PF changes are still unknown. These changes may be enough for regional councils to regulate planting permanent forests the same as we would exotic forests that currently fall under the NES-PF. From a GWRC perspective, it may be more manageable to monitor and keep track of permanent forests if they automatically fall under the NES-PF due to the existing internal systems/processes that are already established.

12. If there were to be additional management requirements for transition forests, what do you think they should be for?

Why? Please explain your answer here.

From a regulation perspective, management requirements should align with those under a revised and strengthened NES-PF, specifically around setbacks from waterways, wetlands, etc. (with the caveat that the NES-PF settings have been revised to provide better environmental protection).

13. Do you think transition forests should be required to meet specific timebound milestones to demonstrate they are on a pathway to successful transition?

☐ Yes

☐ No

☒ Unsure

Please explain your answer here.

We would need to better understand the level of effect when milestones aren't met with these types of forests. What is the environmental impact from someone not planting X/Y species on a particular bit of land by a certain date? The level of negative impact will determine the necessary level of intervention. This is an outcomes-based approach.

14. Do you agree with this proposal to allow transition forests to be permitted to clear-fell small coupes or strips to establish indigenous species?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here.

Yes, so long as this is restricted to small-coupes or strips, which are defined to limit the areal extent so there are very low risks of environmental damage, then this could be a positive option to allow site specific replanting to be done where areas can be targeted with indigenous species.

If you agree, what other restrictions should there be?

15. If forest management requirements are implemented, do you think these should be prescriptive or outcomes-focused?

☐ Prescriptive requirements

☒ Outcomes-focused requirements

☐ Neither

Why/Why not? Please explain your answer here.

Due to the variability between forest sites, there should be enough flexibility to allow forest managers to adapt to various circumstances. The variability is often down to the soil makeup of the site and potentially the value of certain areas (e.g., watercourses, wetland etc) which may not be known initially. The nature of forestry activities is that aspects often change just before or during the activity being undertaken which reinforces why flexibility within the plan is important. Councils should be required to be immediately notified of changes as they occur.

16. What are your views on forest management plans?

Please explain your answer here.

17. What should forest management plans include?

Please explain your answer here.

Forest management plans should include:

- Land ownership details
- Land description: topography, geology, erosion issues that will need management, etc.
- Forest description: forest type, values, flora/fauna, pests/weeds.
- Forest management details:
    - outcomes sought
    - managing risks (including mitigation measures) especially those exacerbated by climate change (fire, pests),
    - selective felling process if any,
    - Transition forest management where relevant (indigenous species must be appropriate to the area, pest control, monitoring, etc.)

18. Who do you think should be allowed to verify and/or monitor forest management plans?

Please write your answer here.

The applicable territorial authority should be able to monitor the forest management plans (but must be appropriately resourced to do so).

19. How often do you think forest management plans should be re-verified?

Please write your answer here.

-

20. What do you think should happen if there are not enough people to verify forest management plans?

Please explain your answer here.

-

21. Do you think the use of existing compliance tools are appropriate?

☒ Yes

☐ No

☐ Unsure

Please explain your answer here.

If there is clearer direction on what is required within a forest management plan, then we think the use of existing compliance tools are appropriate.

22. Do you think there should be new or expanded compliance tools for permanent forests?

☐ Yes

☐ No

☒ Unsure

Which ones and why? Please explain your answer here.

-

23. Are there other compliance options that you think we should consider?

Please write your answer here.

-

24. For the compliance tools you think we should have, when do you think they should be used?

Please explain your answer here.

-

Provide general feedback

Any general feedback on the consultation

Add your comments, ideas, and feedback here

Local authorities need to be adequately resourced to monitor and enforce a complex set of requirements of permanent forests and transition forests.

Upload supporting documentation

Is this submission for both the NZ ETS review and redesign of the permanent forest category consultations?

☒ Yes

☐ No

Submission

By

to the Ministry for the Environment

and

to the Ministry for Primary Industries

on

the Review of the Emissions Trading Scheme

and on

a Redesigned NZ ETS Permanent Forest Category

11 August 2023

Prepared by:
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1 INTRODUCTION AND SUMMARY

1.1 This submission in response to the Review of the Emissions Trading Scheme[i] and permanent forestry category changes[ii] is made by The New Zealand Initiative (the **Initiative**), a Wellington-based think tank supported primarily by major New Zealand businesses. In combination, our members employ more than 150,000 people.

1.2 The Initiative undertakes research that contributes to the development of sound public policies in New Zealand and the creation of a competitive, open and dynamic economy and a free, prosperous, fair and cohesive society.

1.3 The Initiative's members span the breadth of the New Zealand economy; a well-functioning Emissions Trading Scheme and a cost-effective path to Net Zero is important to them. The views expressed in this submission are the views of the author, not those of our members.

1.4 We do not aim to comment on all aspects of these documents. We focus on the areas within our policy expertise.

1.5 In summary, we submit:

(a) The Emissions Trading Scheme can usefully be strengthened;

(b) The proposed options do not usefully strengthen the ETS. Accurate problem definition is needed if effective improvements are desired;

(c) The ETS should maintain its focus on net emissions, rather than gross. The Climate Commission should maintain a sharp focus on ensuring the accounting is sound;

(d) Policy problems unrelated to net emissions should not be addressed through the ETS. They require their own separate instruments;

(e) Permanent forest considerations in the ETS should be guided solely by sound carbon accounting, with other considerations and consequences left to the levels and branches of government best placed to deal with those considerations;

(f) The ETS should be strengthened by:

a. Reforming the price cap to track a weighted average of international carbon prices in emission trading schemes that the Commission considers credible;

b. Legislating the number of unbacked units available to be issued or allocated between now and 2050;

c. Complementing the ETS with policies addressing other issues as they arise, rather than trying to address each through tweaks to ETS settings;

d. Maintaining regime certainty by avoiding threats to the underlying institutional structure or the property rights inherent in emission certificates;

e. Addressing equity issues that arise as carbon prices rise by redistributing collected ETS revenues as a carbon dividend rather than using those revenues for industrial subsidies or other projects.

2 PROBLEM DEFINITION AND THE EMISSIONS TRADING SCHEME

2.1 The Climate Change Commission and the current Government have come to a view that gross emission reductions should be prioritised. The Commission consequently recommended that the government change the ETS to strengthen incentives for gross emissions reductions and to manage the amount of exotic forest planting the scheme will drive.

2.2 Both pieces of advice put New Zealand's path to net zero at risk.

2.3 New Zealand's Zero Carbon Act sets a legislated goal of net zero by 2050. The Act sets a net target, rather than a gross target. And from its initiation, the Emissions Trading Scheme was designed around net emissions rather than gross emissions. Prioritising gross emission reductions, despite cross-party support for legislation setting a net emissions target, puts political consensus at risk. It also asks the ETS to take on a task for which it was not designed.

2.4 There is very good reason to target net emissions rather than gross emissions. The atmosphere simply does not and cannot care whether the next tonne of greenhouse gas fails to be in the atmosphere because someone did not emit that tonne, or because it was sequestered in a tree, or because it was captured directly from the atmosphere by new and emerging technologies.

2.4..1 If this is not true, it can only be because the accounting on sequestration is wrong. It is important that the accounting be correct.

2.5 From the outset, the ETS has aimed to be neutral across technologies and across methods for reducing net emissions. The balance between gross emission reductions and sequestration or capture was to be found as individuals, households, and businesses responded to carbon price signals.

2.6 Economist Alex Tabarrok says that a price is a signal about scarcity wrapped in an incentive to do something about it. The ETS price signals the relative scarcity of the atmosphere's capacity to absorb further greenhouse gas emissions. It also provides an incentive to avoid creating emissions in the first place, if the cost of avoiding emissions is less than the ETS price, and to sequester emissions from the atmosphere, if the cost of sequestration is less than the ETS price.

2.7 Public commentators sometimes damn the ETS as providing inadequate incentive because one sector or another has not reduced emissions by as much as the commentator might have liked – particularly in sectors that are obvious and publicly salient, like road transport. But if emissions from transport reduce by less than emissions from other sectors, this is evidence only of that abatement costs in transport are higher than other sectors.

2.8 The carbon price in the ETS creates information that otherwise did not and could not exist. The price, in combination with different sectors' responses to that price, tells us where the lowest hanging fruit are to be found for achieving net emission reductions. New Zealand *discovers* where net emission reductions are most cost-effectively achieved by watching responses to carbon prices.

2.9 The same holds true in every other sector as well. When a cyclone hits Hawkes' Bay and lettuce is in short supply, we don't expect government to set plans saying how much reduction in lettuce consumption is expected from different sectors. Rising prices automatically provide the signal of increased scarcity, and the incentive to do something about it. Households, restaurants, caterers and everyone else respond to that signal as makes most sense given their circumstances. We collectively *discover* where reductions are most cost effective. It would be ludicrous to complain that, for example, high-end restaurants had not reduced their lettuce consumption by enough – or that home gardeners had not increased their own lettuce planting sufficiently. It sorts itself out in the same way that allocation and production of countless millions of other goods and services sort themselves out as actions and plans coordinate through the price system. And the same is true of carbon emissions in a well-functioning Emissions Trading Scheme, or under a carbon tax.

2.10 A well-functioning ETS that targets net emission reduction finds the appropriate balance between gross emission reductions and carbon removals. Whatever that balance *is*, is the right balance. The process defines the right outcome; there is no appropriate external standard for evaluating what the right balance might otherwise be.

2.11 As market participants discover new ways of responding to the incentives provided by carbon prices, other problems that have nothing to do with carbon emissions will emerge. It is impossible to predict in advance what those problems might be. Each of them should be addressed by the level and part of government best suited to dealing with each emergent problem.

2.12 Consider the perils of the alternative approach, which would require the ETS to reconsider which forms of carbon sequestration or gross emission reduction it might recognise or to what extent – because carbon prices encourage 'too much' of the activity resulting in other ancillary problems. A few simple hypothetical examples follow:

2.12..1 Carbon sequestration through olivine transformation proves highly cost-effective, but olivine mining causes changes in land use and community concerns about heavy truck traffic. Rather than use consenting processes to mitigate externalities from mining or appropriate road-user charging and roading upgrades to deal with truck traffic, the Climate Commission is asked to pretend that this form of direct-air-capture carbon sequestration does not sequester carbon – to reduce the incentive to engage in olivine mining.

2.12..1.1 A new methane inhibitor for livestock proves highly cost-effective in reducing biogenic methane emissions. For sake of argument, let us imagine that this happens after biogenic methane emissions are brought fully into the ETS as CO2-e and are subject to the ETS cap – or are subject to their own methane trading system. The new methane inhibitor unfortunately increases nitrogen concentration in cattle urine. And because dairy farmers face lower methane charges with lower emissions, dairy farming becomes more profitable and there is an increase in dairy conversions. All of it puts increased pressure on overburdened water catchments. Rather than appropriately regulate water quality, the government asks the Climate Commission to put a thumb on the scales to discourage use of the methane inhibitor.

2.12..1.2 A new type of cement is developed that produces vastly fewer emissions. The technology for producing the cement powder is owned by an overseas company who can easily deliver the powder to New Zealand; when used here, emissions from cement are trivially low. But because the overseas company will not licence the powder to large domestic incumbent cement producers and because it will outcompete domestically produced cement, the incumbent faces difficulty. The Climate Commission is asked to level the playing field by requiring surrender of NZU for use of the new cement as though it had the same emissions profile as existing cement – to avoid unemployment at community cement plants. A 'just transition' path is suggested that would allow the new cement to be treated fairly in twenty years' time.

2.12..1.3 A new direct-air carbon capture technology is developed. It can sequester carbon at a cost of $50/tonne and can scale infinitely. It could not only offset the entirety of New Zealand's gross emissions, but also prior emissions if allowed to run at scale. The Climate Commission is asked not to recognise this new technology because, if it were allowed to generate NZU at $50/tonne, there would be weaker incentive to reduce gross emissions and New Zealand would not achieve the wholescale industrial, social, and economic transformation that some might otherwise desire.

2.12..1.4 A high carbon price makes people wish to avoid housing that has high carbon cost and prefer apartments and townhouses near the city centre. However, cultural concerns are raised about the shift away from suburban living, with commensurate concern about potential reductions in family size and an aging population. A conservative government encourages the Commission to consider a higher NZU surrender requirement for electricity used in apartments as compared to electricity used in detached suburban homes to avoid this undesirable change in housing use.

2.12..1.5 A rising price on biogenic methane emissions in agriculture, when those emissions finally face an emission price, results in reduced herd sizes and changes in rural land use. The Commission is asked to redo methane accounting to reduce the likelihood that emission pricing results in land use change, because of a view that emissions prices were not intended to result in land use changes.

2.13 None of these scenarios are difficult to imagine. Nor are others. If the response in each of these cases if they emerge, or in countless other potential scenarios that will emerge, is that the Climate Commission must rejig the ETS in new and bespoke ways, how on earth can we possibly get to Net Zero? The Commission will be required to spend most of its time holding inquiries and submissions processes on ways of rebalancing the ETS to deal with every new concern that arises about the different ways that people respond to price changes.

2.14 If every new development requires a rejigging of how the ETS works, we will be baking fundamental regime uncertainty into the ETS. NZU prices will no longer reflect the marginal cost of preventing the next tonne of carbon from being in the atmosphere, along with expectations around technological development. They will instead reflect bets on countless arbitrary decisions about which kinds of emission reductions will be treated fairly, and which kinds of emission reductions will be politically skewed by the Commission in response to hints from the Government about which kinds of reductions should be favoured or disfavoured.

2.15 We have already seen how regime uncertainty plays out when the government sent signals that it would erode the value of NZU generated in forestry. One carbon market participant reported in Carbon News, “We’ve been speaking to some very angry forestry people and some very confused emitters. Foresters don’t know if they can plant and emitters don’t know if they can use those units to offset after 2025.”[iii]

2.15..1 The consequence of regime uncertainty in forestry: a rapid bringing-forward of planting decisions, in hope of grandparented exemption from whatever harm the government might impose on the market, and a dumping of existing forestry credits, because their future value became far more uncertain and using them for immediate NZU surrender requirements made more sense. The government plausibly here helped to *cause* the exact problem that the government thought needed to be addressed: rapid afforestation. It was obvious and foreseeable. If you threaten a future ban on an activity, anyone who had planned on engaging in the activity at some future date will have strong incentive to do it now instead.

2.16 Again, and to emphasise: using this kind of process for myriad issues that arise on the path to 2050 will massively increase the cost of reaching net zero. It will regularly throw the carbon market into disarray and in doing so will erode political support for the single most important instrument for reaching net zero. A regularly-dysfunctional carbon market combined with fundamentally politicised calls about which emissions count, and which do not, will play into every conspiracy theory that Net Zero is not about reducing emissions but is rather about micromanaging choices in pursuit of other agendas.

2.17 The Government seeks advice about ETS design choices in forestry: which types of trees should be allowed; whether location or land ownership should be a relevant consideration; how to ensure that a transition forest transitions; and, how best to manage permanent forests. The only design choice that should be relevant to the ETS is ensuring that carbon accounting for transition forests accurately reflects actual sequestration. And, of course, carbon accounting should be accurate. All sequestration should be accurately accounted. And forest management should not be a matter for the ETS to consider except to the extent that it affects accurate carbon accounting. It is perfectly reasonable for government to want to ensure that forest management is sound – but that process should be separate from considerations around the Emissions Trading Scheme. Sound forest management should apply to permanent and production forests.

2.18 There is an obvious better solution to piecemeal changes to the ETS as non-carbon issues emerge. Keep the ETS laser-focused on net emissions and on ensuring the accounting is right. And let other parts of government suited to dealing with other problems deal with those other problems as they emerge through their own targeted interventions. In the case of forestry:

2.18..1 If there are externalities from forest planting, that's a land-use planning issue best dealt with through normal council land use planning and consenting. If there are problems with forestry conversions, it could well matter for both carbon and production forests.

2.18..2 If the government wishes to encourage planting native trees rather than exotics for non-carbon reasons, it should provide a biodiversity subsidy reflecting the value that it thinks the country receives from native plantings, while letting landowners make their own decisions about what to plant. It is encouraging that the government is consulting on a biodiversity credit regime.

2.18..3 If the government worries that a carbon forest might be abandoned by its owner and that future surrender obligations in case of fire or other calamity might not be met, consider bonding, insurance, or potential to seize the property for unmet NZU surrender obligation. Consider ongoing monitoring that would provide an early warning if risks were mounting. Any of these policies would need to be evaluated on their own merits, but they are surely better targeted than asking the ETS to pretend that a tree does not sequester carbon.

2.18..4 If political pressure caused by rapid economic change in local communities is unbearable, let that pressure be alleviated by local councils setting restrictions on further afforestation through land use planning regulation – ideally with guidance from central government encouraging regular reassessments of such restrictions so they can be eased if circumstances change. Doing so would be the equivalent of banning the land use changes that eventuated after the removal of sheep subsidies decades ago, but at least the policy could be evaluated on its own merits.

2.18..5 And if other problems emerge along the path to 2050, which surely will happen, those problems should be dealt with individually by the level and branch of government best suited to dealing with each of those specific problems.

2.19 This obvious better solution is longstanding in the economics literature. It is called the Tinbergen Rule.[iv] The Tinbergen Rule says that if you have multiple policy objectives, you need at least as many policy instruments as you have policy objectives. Or, in other words, you need at least two stones if you want to hit two birds. Trying to force the ETS, designed to deal with net emissions, to deal with non-carbon objectives will mean that the ETS will be worse at dealing with carbon while also doing a poor job of dealing with the other

objectives. It is simply very poor policy design to force the ETS to do multiple jobs. It has one big job that no other part of government is equipped to handle: pushing net emissions down to zero by 2050. Let it do its job while ensuring that the rest of government deals with other problems that emerge along the way.

2.20 We suggest a modified version of the Commission's Option 1.

3 Option 1a: Strengthen the ETS to set a durable path to Net Zero.

3.1 First, reset the ETS price cap. Rather than setting a nominal price anchor at a fixed dollar amount, set the cap as being identically equal to the volume-weighted average carbon price in international Emissions Trading Schemes that the Climate Change Commission considers to be credible. The price cap will rise and fall with international prices.

3.2 Abolish the Cost-Containment Reserve.

3.3 Legislate the number of unbacked units that can be issued or allocated between now and 2050. That quantity, plus outstanding previously-issued unbacked units, represent the total quantity of net emissions from New Zealand's covered sector from now through 2050 and beyond. Set that quantum as a property right in newly issued NZU: if future governments issue more unbacked NZU than legislated, the rights of existing NZU-holders are eroded and they can seek compensation. The number of unbacked NZU will be fixed and certain, made durable by threat of litigation by and necessary compensation of existing rights-holders.

3.4 When ETS prices reach the price cap, one of two things happen:

3.4..1 If the global average cost of carbon is *above* the government's cost of creating NZU by planting native trees on the DoC estate, or by implementing other measures that reliably sequester carbon and generate NZU, the government will undertake activities that generate *backed* NZU. Those NZU will be sold at the price cap. The government will earn revenue from each NZU sold.

3.4..2 If the global average cost of carbon is *below* the government's cost of creating NZU by planting trees, the government will purchase ETS credits in the lowest cost carbon market that the Climate Commission has already deemed credible. The cost of such purchases will be below the NZU price cap. Those units will be used to back NZU issued and sold at the price cap. The government will earn revenue from each NZU sold.

3.5 No limit is set on the quantum of *backed* units issued at the price cap because they do not affect net emissions. The quantum instead finds a natural limit: there is only so much land suitable for planting on the DoC estate, and New Zealand purchases of credits on international markets would bid up international prices – which would automatically increase New Zealand's price cap. If a credible foreign market closes itself to purchases by the New Zealand government, it is removed from the average that defines the price cap to avoid the risk that the government loses money at the price cap.

3.6 Because the quantum of unbacked units issued or allocated henceforth is fixed, government can shift focus away from fixed-period carbon budgets.

3.6..1 Currently, the government finds itself deeply troubled when someone buys and holds an NZU against future obligations rather than redeeming it immediately: future surrender could risk some future carbon budget. But the atmosphere ought to strictly prefer later emissions over earlier emissions for durable greenhouse gases that accumulate. It is better for an NZU to be surrendered a century from now rather than today, because that tonne of emissions will have spent a century not being in the atmosphere and causing harm. The best NZU is one that is not surrendered, or whose surrender is long delayed.

3.6..2 Current settings introduce unnecessary anxiety and focus on issues that do not help the climate. Concern over whether NZU will be surrendered on this side or the other side of an emission budget period can result in government deciding to provide very large subsidies to very large emitters, in hope of encouraging emission reduction to fall on the appropriate side of a budget window. If the quantity of unbacked NZU is strictly fixed, then the Commission should not need to worry about the timing of surrender.

3.6..3 With a fixed quantum of unbacked units, even the number of annually issued unbacked NZU will not have much effect on annual surrender volume. If the government issues 'too few' units in any given year, people will draw from stockpiles. If the government issues 'too many', people will stockpile against future price increases. Because the quantity is fixed, a greater volume of issuance today is necessarily at the expense of future issuance. A standard Hotelling-style[v] price path will eventuate.

3.7 With a fixed quantum of unbacked units, government can always decide to buy back and retire credits if it wishes to effect a tighter path to net zero.

3.8 All revenue that the government earns at ETS auction, or that it earns by backed unit sale at the price cap, or that it earns from any excess dividends it thinks it earns from its stake in the electricity companies when carbon prices are high, should be set aside for a carbon dividend. A carbon dividend makes rising carbon prices more politically durable.

3.9 Finally, ensure that the ETS remains focused on net emissions and that the Climate Change Commission remains focused on ensuring that accounting within the ETS is correct.[vi]

4 Conclusion

4.1 Introducing uncertainty about the institutional settings underpinning the ETS puts New Zealand's climate response at risk.

4.2 Responding to challenges brought about by carbon forestry through changes to the ETS, rather than dealing with them at source, sets a very poor precedent.

4.3 There remain decades between now and 2050. It is impossible to foresee what unintended consequences may emerge as people respond to changing technologies and changing carbon prices. All manner of changes may eventuate.

4.4 If everyone expects that the New Zealand government will follow a sensible policy process that addresses externalities as and where they emerge and deals with them through instruments targeted to those problems, we will be on sound footing for reaching 2050. People can invest in new carbon mitigation and sequestration technology in the expectation that real sequestration will be recognised with NZU, and that they need to deal with local land use planning if there are relevant externalities. It sets the appropriate incentives.

4.5 If instead people expect that political considerations will cause real sequestration to be ignored by the ETS, or that lobbying for changes to the ETS can be a low-cost way of protecting one's own industry against changes, we will get that result instead.

4.6 The ETS can usefully be improved. But shifting its focus to gross emissions, and opening the system to ongoing lobbying efforts to upweight or downweight different forms of real sequestration, does not improve the ETS. It forces a more costly path to net zero – a path at greater risk of being abandoned.

[i] Ministry for the Environment. 2023. *Review of the New Zealand Emissions Trading Scheme – Discussion Document.* Available at https://environment.govt.nz/assets/publications/climate-change/Review-of-the-New-Zealand-Emissions-Trading-Scheme-Discussion-Document.pdf

[ii] Ministry for Primary Industries. "Proposals to redesign the permanent forest category in the New Zealand Emissions Trading Scheme." Available at https://www.mpi.govt.nz/consultations/proposals-to-redesign-the-permanent-forest-category-in-the-emissions-trading-scheme/

[iii] Carbon News. 2023. "Carbon price crashes, "split market" developing. 7 July. Available at https://www.carbonnews.co.nz/story.asp?storyID=28148

[iv] We discuss the Tinbergen Rule, in application to carbon emissions policy, in our 2022 submission on Managing Exotic Afforestation Incentives. Available at https://www.nzinitiative.org.nz/reports-and-media/submissions/submission-managing-exotic-afforestation-incentives/

[v] Hotelling, Harold. 1931. "The Economics of Exhaustible Resources." *Journal of Political Economy*. 39:2. This has literally been known for over nine decades. The Commission's worries about the timing of forestry credits seem to ignore Hotelling pricing.

[vi] See also our 2022 submission to the Environment Committee on the Emission Reduction Plan, available at https://www.nzinitiative.org.nz/reports-and-media/submissions/submission-the-emission-reduction-plan/

BARRY BARTON

[redacted]

9 August 2023

The NZETS Review
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Submission on the Review of the NZETS

My name is Barry Barton. I am a Professor of Law at the University of Waikato, specializing in climate change law and energy and natural resources law. I teach a course on Climate Change Law. I have affiliations and connections with organizations in academia, industry, and environmental advocacy, but I make this submission without reference to those organizations or the University, in my private capacity. I offer an informed but independent perspective.

My submission is anchored in the simple but important point that we have an exotic forests problem, not an NZETS problem. We should make policy changes to address the exotic forests problem specifically, and not make other changes.

The current undue prominence of exotic forestry presents two problems:

(i) Integrity of the emissions reduction of forestry as a GHG removal, and its higher level of risk compared with gross emission reductions, and
(ii) Land use: excess uptake of land by exotic forests, poor forestry practices.

The exotic forests problem needs to be addressed; New Zealand cannot plant its way out of its challenges in reducing its GHG emissions.

It is true that New Zealand needs to make gross emission reductions more rapidly than at present. The lack of speed is not the fault of the NZETS. Generally, gross reductions are slow because of reasons outside the NZETS. The NZETS was never intended to be the only policy instrument. Other policy instruments such as GIDI, the Healthy Homes Standard, and the Clean Car Standard are essential, and the role that they play cannot be replaced by tinkering with the NZETS.

In fact, the NZETS is working as it was intended; as a price instrument it allows firms and individuals to make their own decisions about their activities and allowing them find the lowest-cost abatements. However, like any policy instrument the NZ ETS needs adjustment from time to time, in order to achieve its purpose. The adjustment should be a careful and well-tailored one.

I submit that removals generally should be encouraged, not discouraged. I support policy changes that make the NZETS receptive to removal activities that are credible and dependable. The reason is that New Zealand needs all the successful removals that it can get, along with gross emission reductions. As far as the atmosphere is concerned, a tonne is a tonne, whether it is a reduction or a removal. Our climate challenge is so great now that as a nation we are not in a position to be choosy or nice about removals. Changes to the NZETS should be directed to exotic forestry, not all removals.

It is important that the NZETS is kept as simple as possible. We must not over-complicate the NZETS. We must solve the exotic forests problem, not other non-problems near to it, and we must not throw the baby out with the bathwater.

One value that the Discussion Document does not identify is the social licence to operate of the NZETS, and I submit that efforts must be made not to impair the Scheme's existing social licence by changing it unnecessarily and making it complicated. The NZETS has general acceptance in society and in policy circles as the nation's primary policy instrument to reduce GHG emissions, and a wide band of people in the policy universe have a broad understanding and acceptance of how it works. This is vital, and must not be undermined with changes that introduce complexity that create confusion. It took enormous effort to institute the NZ ETS and to get it operating as it should. Changes should be kept as simple as possible, so as not to damage the Scheme's hard-won social licence.

Answers to Consultation Questions as Numbered in the Discussion Document

3.1 I agree that there is a case for ensuring that the NZETS does drive gross emission reductions.

3.3 It is very important that we maintain incentives for removals, because (i) as far as the atmosphere is concerned, good removals are just as effective as gross removals; 'a tonne is a tonne;' and (ii) we need all the reductions we can possibly find; as a nation, we have left climate action much later than we should have, and we are not in a position to be choosy.

5.1 There should not be a heavily-weighted prioritization of gross emission reductions; the objective of the review should be to reduce the emerging undue reliance on exotic forestry removals. There should not be a subordination of removals.

5.2 Yes but the NZETS on its own is often insufficient to bring about these changes; policy instruments outside the NZETS are generally recognized as necessary and effective to secure the uptake of low-emissions technology, energy efficiency and other abatement measures. Slow uptake of these changes is not due to any fault in the NZETS except for unduly low prices for NZUs.

5.3 Yes, but without making unnecessary distinctions between short, medium and long term removals.

5.4/5.5 One important criterion or consideration that should be added is "supports public confidence and acceptance of the NZETS". This is touched on in the Discussion Document in relation to the functionality of the NZETS, but it is different in character.

It is important not to lose the social licence that has been painstakingly built up for the NZETS.

6.1 Option 3 best aligns with the primary objectives.

6.2 Option 3 needs to be targeted at reduced incentives for exotic forest removals, not removals generally. If this is done then the assessment of "low" support for removals would not be correct for other removals. The Discussion Document makes the case that the role of exotic afforestation needs to be managed, so it is positive that Option 3 would reduce support for that particular kind of removal.

6.3 Option 3, for the reasons given above. It can lead to the policy measure that is the best targeted to the identified policy problem, with the least disruption or reorganization of the NZETS as a policy instrument that is otherwise working well.

6.5 Yes, policy measures are required outside the NZETS to remove market and non-market barriers to the uptake of low-emissions technology and behaviour. Other policy measures are required to manage the adverse effects of exotic forestry as a land use.

7.1 Incentives for co-benefits should be aligned with the NZETS but should operate outside it, such as with biodiversity credits. The focus of the NZETS should stay on GHG emissions.

7.4 Yes a wide range of removals should be included in the NZETS; but they certainly must be credible in terms of additionality, permanence, and scientific validity. We need all the removals we can get. Uncertainty about entitlements to NZUs under the NZETS should not be allowed to hinder the development of credible removals.

Yours sincerely

Barry Barton

New Zealand Institute of Forestry
Te Pūtahi Ngāherehere o Aotearoa Incorporated

Submission on the discussion document Review of the New Zealand Emissions Trading Scheme

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21 August 2023

Introductory Comments

Thank you for the opportunity to submit on the discussion document: Review of the New Zealand Emissions Trading Scheme (ETS review).

NZIF acknowledges the statement in the ETS Review page 4

> *We want to hear your thoughts on both issues – and will try to incorporate all your feedback on both topics, regardless of how you provide us feedback. However, when you are providing us feedback, please try to target your feedback to the relevant consultation feedback questionnaire.*

NZIF agrees both the ETS Review and the discussion document on proposals to redesign the permanent forest category in the NZ-ETS (Permanent forest) issues are intricately intertwined and as such NZIF has elements of both outlined in our submission. However structurally we have only addressed the Questions relating to the ETS Review in this document.

If appropriate, the New Zealand Institute of Forestry (NZIF) wishes to be heard in support of its submission.

About the Submitter

The New Zealand Institute of Forestry (NZIF) was incorporated in 1929. It has approximately 900 members who are individual professionals in forestry. The NZIF's objects are to advance the profession of forestry in New Zealand and to be an independent advocate for forestry.

The NZIF is committed to serving the practice of forestry and the wider community through education, accountability and its code of ethics and performance standards. It fulfils a quality assurance role, setting the benchmark for professionalism and the quality of advice and practice by which members and others in the profession are measured.

NZIF members are concerned with the professional management of all forests, plantation and natural, conservation, protection and commercial. They can be found in forestry companies, consulting businesses, research institutes, educational facilities, government departments and providers of specialist services.

The members' qualifications and areas of expertise reflect the diversity of disciplines involved in managing all types of the NZ forest resource from traditional forestry degrees through science, economics, law, microbiology, hydrology, engineering, and resource management.

NZIF operates a regulated registration scheme which controls the registration and conduct of forestry professionals, whether they are consultants providing forestry advice to the public and private entities or acting in other roles.

Submission Summary and Recommendations

NZIF is deeply concerned;

- The driving motivations for the proposals are as much related to political short-termism as they are to actual fact or need.
- The lack of sufficient modelling or transparency in data to properly evaluate and respond to issues which have enormous ramifications across a range of parties in NZ is in our view unacceptable. Similarly, the insufficiency of time to reconstruct our own modelling or workshop with policy makers' risks poor policy outcomes.
- The mechanisms and objectives behind afforestation have lost clarity and become conflated with hysteria over farm conversions and other political agendas. NZ needs to clarify forestry objectives mechanisms as those required to stabilise NZ's productive plantation forest sink to support an export and processing bio-circular economy and those required to expand our permanent sink to offset future difficult to remove emissions as well as compensate for our slow historic progress.
- Changes to the market regime should not be considered until changes to the permanent forest ETS eligibility frameworks are decided and implemented and clarity of future trajectories achieved. We suggest limitations discussed in the permanent forest redesign section may sufficiently restrict new permanent afforestation.
- Stability in the current ETS market needs to be re-established by confirming future ETS changes will not be retrospective and existing participants will be 'grand-parented'.
- If there is to be future changes to the market structure in respect of forestry, such controls will be upon projects and area made available for entry to the ETS scheme – not artificial price control or market monopolisation (single government buyer).
- MPI/MFE had not, should have and now need to form a specialist competent consultative working group to assist them in refining and understanding details which will make policy and regulatory frameworks operationally sound.
- A NZU in the ETS market should be treated equally and not have any distortions or value of one NZU relative to another.

Submission

Background

NZIF deeply concerned about the apparent lack of good data upon which to judge the veracity of the proposals. However, we believe there are fundamental issues to be partitioned to gain clarity on what the objectives of forestry's contributions to NZ's efforts to achieve Net Zero by 2050 actually are.

Principals Underlying our Response.

In our view there are two concurrent but not necessarily parallel objectives – in aggregate they serve to meet NZ commitment to the Paris agreement and assist in NZ 's journey to net zero by 2050 and beyond.

Separately they are;

1. Stabilise NZ's current forest carbon sink so it can provide a solid base of sequestered carbon which is not oscillating between being a source of removals and a source of emissions. This is a first step in meeting the county's obligations.
2. The second is to provide for added removals over and above the stable sink to absorb carbon or carbon equivalents where the country as a whole has failed and or can't do so.

With those objectives in mind the question then becomes how best to do it?

- With what forestry models
- And with what forms of encouragement.

NZ's Plantation Forest Sink.

The plantation forest estate in NZ has been subject to waves of afforestation and deforestation over its history of development. The causes have been strategic, political and economic including from economic distortion arising from policy settings. In the recent past, fears about the encumbrance created by the ETS, undermining of the ETS (hot-air units) and rampant (predominantly) dairy expansion without constraints upon nitrate leaching, water quality, carbon and carbon equivalent emissions and cheap access to water all contributed to significant levels of deforestation in the NZ plantation forest estate. This has only started to reverse in recent times.

The national exotic forest description as at Apr 2022 indicates the estate size in 2019 was 1,697,000ha[1], some 130,000ha smaller than it was in 2003 which represented the maximal scale of the estate after which planting rates did not keep up with the rate of harvesting and

[1] NEFD

deforestation to pastoral agriculture. Fig 1 illustrates the price path for NZU's in relation to the repeat and regular policy interventions and adjustments along with the trends in registration onto the ETS. This is compared with the annual area in each age class of the current exotic estate over the same period which is a combination of replanted areas after harvesting and new planting.

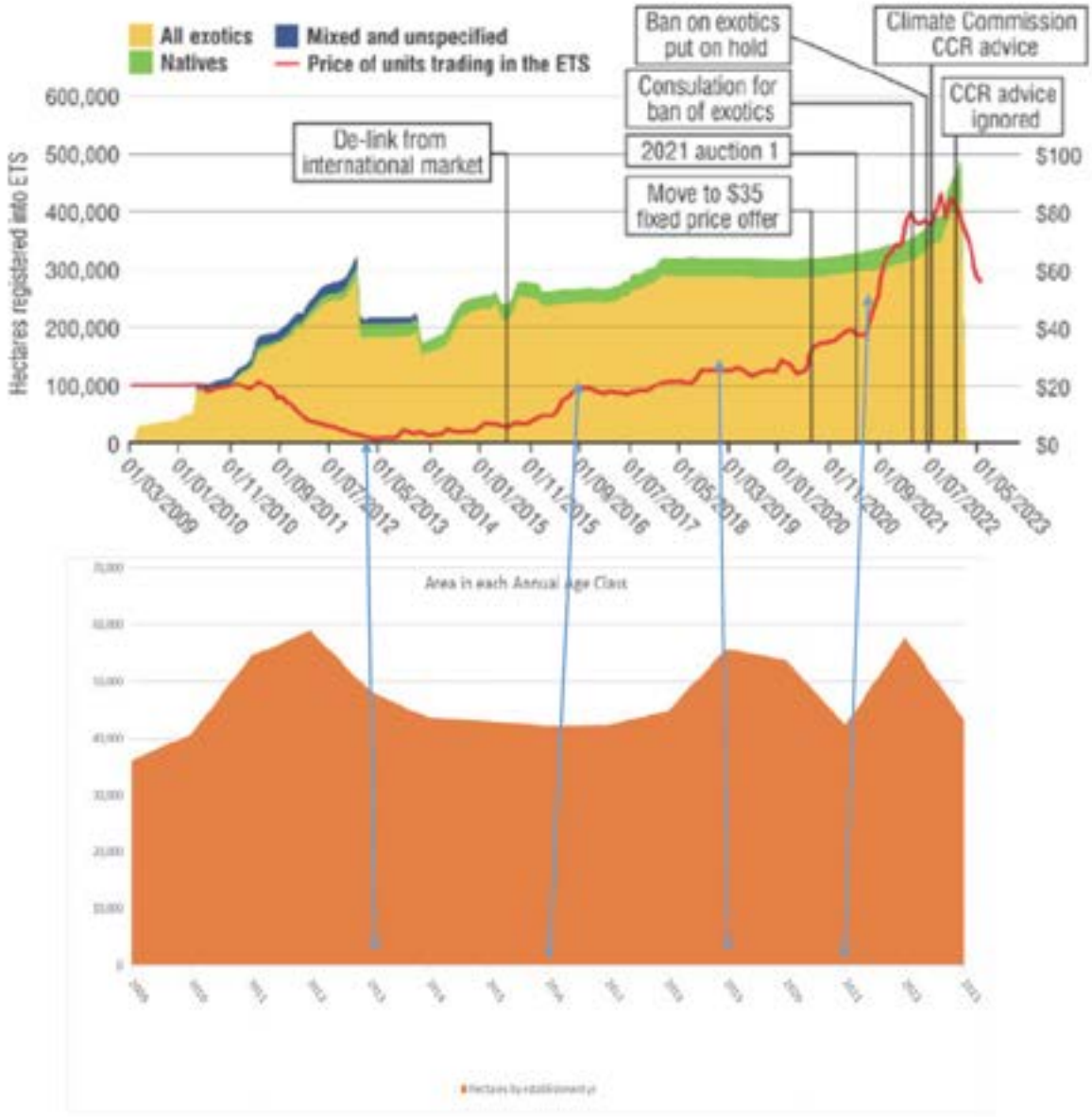

Figure 1

The approximate alignment of dates suggests for those involved in the productive plantation estate and allowing for lag times involving seed orders and nursery production, there was plenty of incentive to deforest while prices were low and not much incentive to afforest until the NZU price rose above $25 an NZU. Figures are not available for 2023

though new planting (not including replanting) for 2022 is listed as 45,000ha and the total productive plantation forest estate is listed at 1.757 million ha, still 70,000ha short of its previous maximum.

Why the Sink Matters.

A reduction in the size of the estate is one problem – net emissions will be higher into the future than they might otherwise have been. In NZ this has been caused by a variety of factors relating to policy settings directly and indirectly affecting relative economic competitiveness of competing land uses (pastoral and forestry), international market signals and capital flows.

An uneven age class distribution within the existing estate becomes a potentially significant problem because while a growing forest sequesters carbon, it becomes an emitter at time of harvest.

In NZ market signals in the early 1990's led to a large increase in planting over part of the decade followed by a period of low levels of planting (economic signals) and then significant deforestation into pastoral agriculture to get ahead of the restrictions of the impending ETS which would impose penalties upon forest owners who cleared forests.

The result today is a significantly imbalanced age-class distribution which if harvested more or less according to the ages of available stands, will continue to cycle through periods of significant CO_2 removals and emissions which will have to be reported as part of our international climate change obligations. Such imbalances also do little to assist long-term domestic industrial processing.

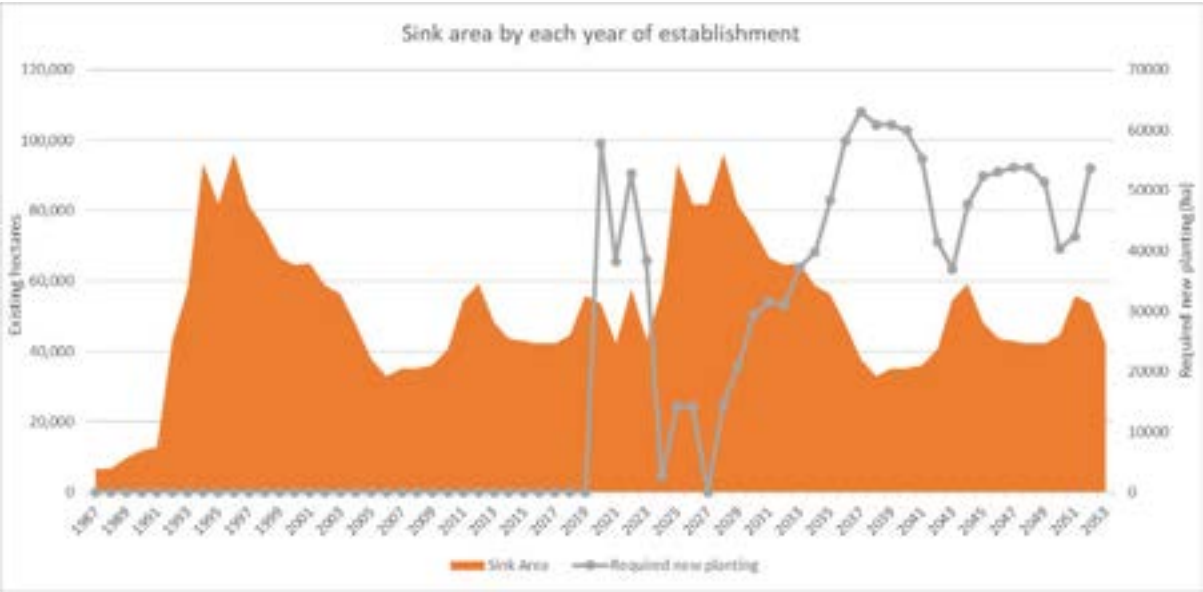

Figure 2

Figure 2 illustrates the concept (without moderation for the individual harvesting and replanting decisions being made now and in the future) and demonstrates both the potential repeating nature of the problem and the annual levels of replanting and new afforestation (catch-up area) which would be required to stabilise this particular sink profile.

Stabilising the Sink.

Based on simple calculation of the difference required to stabilise the unmoderated plantation forest sink over the periods ahead suggests new afforestation, over and above restocking, required between now and 2050 is 1.3 million ha. MPI projections are for 0.97 and 1.44 million ha.

Table 1

Year from (inc 2022)	**Average planting rate (ha/yr)**	**Accumulated added sink (ha)**	**Approx added annual CO_2 removals under averaging (t/yr)**	**Total Plantation Forest estate 2050 sink**
2030	21,900	175,000	0.6562 Mt	3.05 million ha
2050	41,900	1,299,000	12.570 Mt	915Mt CO_2

Key considerations arising.

- Stabilising the current plantation forest sink is a priority. If there is no stabilised forest sink, NZ emissions will be in a constant state of flux. Given the quantities of sequestration involved, stability at some level is important. Stability could be achieved above or below the theoretical level shown above, but if below, NZ will have to accept more aggressive gross emissions reductions, or more permanent forest removal planting (with urgency) or removals from abroad.
- Actual harvesting and subsequent restocking will be driven by market sentiment so peaks will likely be spread out. However, in the near term, NZ will reach peak harvest and without further urgent afforestation, the sink will decline and remain a net emitter for a considerable period into the future.

Year	*2019*	*2020*	*2021*
NEFD afforestation	*19,000*	*34,000*	*45,000*
Projected requirement	*40,297*	*42,359*	*53,736*
Shortfall	*21,297*	*8,359*	*8,736*

- Afforestation undertaken under averaging and as part of an intensively managed production forest estate;
    - Hedges risks associated with fire, biosecurity and permanence of the sequestered carbon.
    - Cements in improved certainty for long term domestic and export oriented processing and circular bio-economic objectives.
    - Indicates higher economic and employment activity in the national and regional economies than the land use it replaces.
- But, in the future world, recognising the expected impacts from increasingly severe adverse climatic events, afforestation for production forests with carbon co-benefits;
    - Will have to be on farmland and other previously cleared land devoid of significant components of indigenous vegetation.
    - Will have to avoid steeplands and highly erodible landforms (this can be managed by a properly applied NES – PF rules).
    - Should be undertaken within an informed strategic framework which identifies broad goals required to achieve critical scales for effective processing outcomes. The Industry Transformation Plan and urgent research needs to complete the detail required to inform this outcome.
- Shortfalls in more or less 'filling the sink' could be compensated by pure carbon only forests. With some caveats, this would be a less favoured route (see commentary on the revisions to the forestry rules) as the preference is permanent forests should be being used to offset our future emissions often using less productive land.
- Responding to the challenge highlighted by the climate change exacerbated storm events on the east coast of the north island is going to lead to a requirement to retire significant portions of both farmland and current forest estate in those regions.
    - For farmland, retirement and reversion or afforestation to native is recommended. It will take an extended period of time and should be targeted for the sequestrations of future hard to eliminate emissions offsets.
    - Within the existing forests there is a potentially significant problem in transitioning the retirement areas to a native forest cover. It is highly likely these estates will become gross emitters for a prolonged period before native biomass meets the current stock inventory of the planted pine.
    - For those areas not as prone to the debris avalanching and gullying which typified the outcomes from cyclones Gabrielle and Hale, where some form of

production forestry may be manageable, it is unclear what models will eventuate, how to transition to them and at what cost or benefit. All these remaining areas, whether registered in the ETS or not have potential to be emitters in transition or stable sinks. There has been little consideration of this aspect in the current discussion documents.

Permanent Forests – Adding to the Nations' Removals Capacity.

NZIF see the key role of permanent forests as being additional to the urgency of stabilising the forests sink. Nevertheless, it is clear the reduction pathway for gross emissions is going to be slow and difficult, particularly if progress in relation to on-farm emissions is slow. Permanent forests provide an important mechanism which in addition to adding to the nation's removals capacity could also provide pathways to:

- Substantially improve landscape resilience in erodible landscapes.
- Improve and assist biodiversity recovery- particularly in lowland areas
- Diversify productive forestry species and management models.
- Be achieved in many cases with little loss in gross economic productivity from existing non-forest land banks.
- Provide alternative employment at regional and sub-regional scales.

Submission on the ETS consultation

Operation of the ETS

NZIF supports the need to focus on gross emissions reductions in the long term. As set out in the prior section afforestation needs to be used to stabilise our forest sinks and where beneficially able, to go some way, particularly in the short to medium term to ease the path as emissions reductions occur from non-forest sectors and in the longer term to offset difficult to abate emissions.

On the basis of the information set out above we do not believe there is any reason for reactive introduction of controls on the basis of concerns about area or annual planting levels.

On the issue of the flow of forestry based NZU's and the impact they may have on the ETS, NZIF is of the view current modelling showing a surplus of units early next decade does not account for the large proportion of the current total of NZUs which are held and will remain held in registry accounts to offset harvesting liabilities.

ETS Redesign Consultation Questions

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

NZIF like many others have concerns about the modelling and assumptions behind them and extends the concern to the fact feedback is being sought on projections upon which further modelling is to be done before further consultation on preferred options is to be undertaken. On the basis of figure 3 projected forestry allocations and surrenders to the ETS the graph seems to show once future NZUs surrender obligations are discounted and at an annual new planting rate of 38000ha, the tradeable NZU quantum is little more than the 20Mt of which around 12Mt simply stabilises the production estate.

The remaining graphs appear based on assumptions about the market price response to supply of NZUs but it is unclear as to the assumption behind the magnitude and purpose of the new plantings – are they all permanent carbon forests only? Is price of NZU's the only dynamic constraint upon the area planted?

In short NZIF are unconvinced there is sufficient data and modelling to verify the concerns of oversupply being expressed at this point and justify such major intervention proposals.

We are aware of a report by PWC in its review of Govt modelling which concluded;

1. there is a "significant level of uncertainty regarding whether the supply of NZUs from forestry will exceed NZU demand"
2. they were critical of the source used to model supply noting *"the mathematical model, which is used to derive the afforestation forecasts, is being used in a context where it cannot be expected to perform best. It is unclear whether it will derive* a reasonable forecast of afforestation with NZU price inputs of around $100".
3. they note the afforestation predicted by the mathematical model is "much higher than historical levels. There is a question as to whether that amount of planting is achievable in practice, and whether there are practical constraints which would effectively preclude that result"

2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

NZIF don't have specific information other than to note some significant fossil fuel emitters had already embarked upon and were traveling down pathways for significant emissions reductions based on the foreseen price of NZU's and the added accountability pressures arising from emissions reporting. Some of those actions included investigations into long term conversion to and use of biofuels. Recent government interventions to invest in emissions reduction directly (NZ Steel) and requests to extend such investment (Fonterra) raise big questions as to the future efficacy of the market with or without changes to the ETS structure or NZU pricing. Big emitters have been sent a signal - delay and you will be rewarded!

2.3 Do you have any evidence you can share about land owner and forest investment behaviours in response to NZU prices?

The evidence is very clear – parties involved in afforestation are sensitive to price /value of NZU's. Figure 1 illustrates the sensitivity of planting to NZU prices and other interventions however the recent announcements in relation to the revision of ETS settings, the failure to follow the Climate Change Commission's Advice and announced future policy positions in respect of forestry by the major political parties have had an almost instant and likely substantial adverse response to forest investment. The current reversal of the Governments position in respect of the ETS auction floor and cost containment reserve may have partially restored some confidence, but any recovery is likely to be slow given the other factors also currently at play.

A research paper into the effectiveness of the ETS, noted:

"Our findings indicate the forestry sector, and the NZ ETS participants within it, have

responded rationally to emissions pricing over time. However, multiple factors such as complex participation requirements, extended periods of policy uncertainty, and weak emissions price signals (particularly over 2011–2016) have likely restricted the effectiveness of the NZ ETS in changing forestry outcomes over much of its operating life"

AND

"However, the signalling of further changes to NZ ETS forestry policy in 2022 has created new uncertainty for market participants. Despite past challenges, the sector's dramatic response to rising emissions prices in recent years demonstrates the NZ ETS is changing landowner behaviour to produce net forestry removals".

2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

The table reflects impacts which can or may occur as a result of forestry in some circumstances. One could equally state replacing "forestry" with "pastoral agriculture" could furnish a comprehensive list of adverse impacts some of which are similar and others of which are unique to the sector, persistent, and collectively extremely damaging – including unabated emissions!

Offering no context or framework, the table will have done little other than fuel the partisan beliefs of those who don't want change within their back yard. Somewhat in the converse of the previous section, to the forest industry there might also be interpreted a signal – we say we want you, but actually we just want your capital at our disposal to be manipulated as seen fit to mitigate the emissions of 3rd parties within the political constraints of an agriculturally based culture!

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

NZIF believe the current ETS definitely has a role in driving gross emissions reductions. In our view, as has been stated repeatedly in the past, NZ must reduce gross emissions and we agree we cannot plant our way out of the problem for many of the reasons proffered in the discussion documents. The primary question at the moment is not whether a properly structured cap and trade system inclusive of forestry can result in pricing sufficiently high to encourage reductions in gross emissions (which it seemed to be doing in recent times), but whether the prognosis for afforestation is, as portrayed in this consultation, so dramatic excessive unit supply will flood the market taking away any incentive to reduce more expensive gross emissions and ultimately crashing the price of NZU's.

The ETS, in its original design, intended, with the inclusion of forestry, to provide the least cost method for meeting the country's obligations. The world and system dynamics have changed over the years and correctly, reductions in gross emissions is recognised as essential. However, any moves which also remove past or future CO_2 emissions from the atmosphere are also extremely important given the overly slow progress in reductions. Domestically NZ has failed and looks likely to fail to bring agriculture (50% of NZ's emissions) into some form of ETS umbrella, Government interventions have initially severely undermined the market (until overseas hot air was de-linked), free allocations have undermined the scale and breadth of the ETS and most recently the Government has directly intervened in subsidising heavy polluters and opened the door to further pressure for direct subsidy which while possibly a justifiable means to accelerate emissions reductions, also reduces the demand for NZU's to be traded.

In our view at this stage NZIF believe expectations for afforestation in the future are unclear, overly optimistic and too early to call given the past and recent history of instability in the market. If there is to be a backstop to retain integrity in the ETS system then the focus should be on the control of land eligibility into the system rather than attempting to 'control' the value of the units. For forestry investors to participate they must have reasonable confidence market conditions remain predictable.

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

NZIF accept the value of NZU's will be set by the balance of supply and demand. This was always the case and includes the eventual inevitability of the price falling to low or zero values if NZ is successful in reducing its emissions to near zero. Afforestation under the ETS is a one-off period of opportunity to drive strategically important changes in emissions, types, sources and land use. It cannot be a permanent feature. The question at stake is one of timing and quantum in the balance between the supply and demand of NZU's.

In the view of the NZIF, the current round of proposed adjustment options seeks to try and manipulate price indirectly to facilitate perpetually increasing prices of NZU's to force changes in emissions reduction. Notwithstanding the fact irrespective of method, if emissions reductions are made, at whatever cost to the emitter and eventually emissions approximate zero, there will be no demand and the price of a unit will also approximate zero. To navigate the journey the trajectories will require constant manipulation and if manipulation is going to discriminate the price of the forestry sink component at the whim of political will, then it is unlikely to attract much private capital interest. NZIF would instead argue the level and finesse of control being sought can only be achieved with the integration of private capital by controlling the eligibility of land quantum which can enter the ETS for sequestration purposes by way of allocation for projects of afforestation.

In summary – NZIF neither agree nor disagree with the assessment, there has not been sufficient time nor data disclosure nor scenario or sensitivity analysis to make an assessment. We note however;

- Efforts to indirectly manipulate price as proposed are unlikely to be very attractive to private capital.
- More directly influencing supply of ETS eligible projects into the supply chain is more likely to give the control and transparency policy makers are seeking while still underpinning the market foundation.

- Adjusting market supply parameters may not however serve other strategic goals such as stabilizing the forest carbon sink nor encouraging investment in native afforestation especially on highly erodible lands. Other mechanisms may still be required and to a large extent this may be determined by the means by which agricultural emissions are managed.
- We have no particular view as to the impact of increased NZU prices flowing through to costs for individuals and sectors of society. This is a given (however in saying this we are unsure of the actual costs and hold a view this has not been modelled effectively to date) as is the likelihood that segments of society, namely those less well off, will be disproportionately adversely impacted thus probably will require some compensatory policy initiatives.

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

NZIF will defer to Māori entities / Iwi to consider this aspect of consultation.

4.2 What other interests do you think are important? What has been missed?

No comment

4.3 How should these interests be balanced against one another or prioritised, or both?

No comment

4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

NZIF will defer to Māori entities / Iwi to consider this aspect of consultation

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

NZIF agree it is a priority gross emissions be tackled and reduced. Whether the ETS is the most appropriate tool to achieve this objective in the light of the almost incessant vacillation over settings, charges, and direct emissions reduction subsidy investments is consistently debated. The Government have stated on numerous occasions the ETS is a key tool (if not the key tool) available to Government and like other similar examples, using tradable rights, the ETS was intended to enable 'the market' to do the heavy lifting without need for regular political involvement. To date it has definitely assisted incentivisation of both reductions and removals all within the very recent past timeframe but its overall performance is more questionable over the time since implementation.

It is not clear how it will perform in the future with the options being promoted. It is very possible for those involved in removals the situation will become too uncertain and their involvement will decline.

Should policy changes lessen the value of existing investment in tree planting, then the signal is strong as entities look to invest further in gross emission reduction strategies (noting there is much work already happening in this space) then it will reduce confidence to invest in what are arguably more expensive gross emission reduction options in the near to medium future.

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

NZIF see this as an important objective of the whole exercise but again note if doing so, the rules around which any investment is made be set in place and protected by grandfathering should changes occur in the future.

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

The enhancement of sinks (emissions removals) is a critically important mechanism;

- As a backstop to failure to achieve reductions in a timely fashion.
- As a mechanism to obtain breathing space while emissions reductions are introduced.
- As a means to leverage and stabilise existing forestry sinks which currently hold many years' worth of gross emissions.
- As a means to achieve other strategic goals from land use change, elevated domestic processing, bio-circular economy and biogenic emissions reductions.
- As a more appropriate way to meet emissions liabilities than purchasing overseas units at indeterminate and potentially very high prices.
- It can and is/was being implemented rapidly.

The ETS in very recent times has supported this objective. It is unclear whether it would continue to do so under the frameworks proposed albeit NZIF notes if option three and four are continued with unabated future ETS related plantings may well cease, as already demonstrated by an almost cessation of ETS related land purchasing and the strong possibility the 2025 new ETS planting area will be very low, assuming all land bank up to end 2022 is planted in 2023 and 2024. In such a circumstance policy would again need to be adjusted or new mechanisms introduced external to the ETS.

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

NZIF consider any options which has the government as a buyer, or indeed the sole buyer, of NZUs as very low value options at best. Australian ERF, as one example and the closest neighbour to NZ, with its Carbon Abatement Contracts having the Commonwealth as the sole purchaser forced sellers / project proponents to one purchaser at the lowest price for the Commonwealth. Project owners and project proponents knew the market only existed because the government were the 95% plus buyer of all ACCUs and this suppressed prices but more importantly limited the scale of abatement to the lowest cost abatement and did not stimulate investment in new abatement opportunities. A market, NZU market being no different, requires depth and breadth of supply and depth and breadth of engaged parties and it is difficult to understand how the government interacting as outlined in Options 2, 3 and 4 will stimulate the market such depth and breadth is maintained.

5.5 Are there any additional criteria or considerations that should be taken into account?

NZIF consider any options which has the government as a buyer, or indeed the sole buyer, of NZUs as very low value options at best. Australian ERF, as one example and the closest neighbour to NZ, with its Carbon Abatement Contracts having the Commonwealth as the sole purchaser forced sellers / project proponents to one purchaser at the lowest price for the Commonwealth. Project owners and project proponents knew the market only existed because the government were the 95% plus buyer of all ACCUs and this suppressed prices but more importantly limited the scale of abatement to the lowest cost abatement and did not stimulate investment in new abatement opportunities. A market, NZU market being no different, requires depth and breadth of supply and depth and breadth of engaged parties and it is difficult to understand how the government interacting as outlined in Options 2, 3 and 4 will stimulate the market such depth and breadth is maintained.

6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

NZIF – we believe anything already in the ETS should not be affected by any future policy changes. Going forward there should be no specific change as assumptions and modelling have not been released or tested.

NZIF believe a reassessment of the forestry models eligible for entry into the ETS should be evaluated before then determining whether further restructuring of the ETS is required.

With completion of proper review and if a change is deemed necessary NZIF believe none of the options are a good choice.

NZIF would be willing to discuss only a mechanism around project entry to the ETS for a limited period of time to restore a sense of confidence noting recent cyclone events and to ensure afforestation is for the best use of land. Post this period of time the market would move away form any mechanisms. Such mechanism could have the following features:

- gives more certainty to participants once they have entry.
- allows administration as to the level of afforestation and subsequent sequestration as well as the types of forest models.
- Gives greater capacity to match climate change removals objectives with strategic "industry transition plans" objectives though the two may still not be in alignment.
- most closely mimics the potential outcome effects of the proposed options 3 or 4 in there becomes a much higher level of control of the scales of afforestation over time without interfering in the market values which will be critical to participants being willing to participate.
- Note however we acknowledge this system will impose significant bureaucratic hurdles to participation of itself will deter much enthusiasm for afforestation from certain sectors.

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

For both of options 3 & 4 we believe there is an assumption new participants will remain eager to invest in the scheme. We believe this is incorrect – both these options have considerable down side risk due to the restricted nature of the market and or the price, particularly if the price setter is solely the Government Regulator acting independently of the open market NZ-ETS price.

Australian Emissions Reduction Fund, as one example and the closest neighbour to NZ, with its Carbon Abatement Contracts. Having the Commonwealth as the sole purchaser forced sellers / project proponents to one purchaser at the lowest price for the Commonwealth. Project owners and project proponents knew the market only existed because the government were the 95% plus buyer of all ACCUs and this supressed prices but more importantly limited the scale of abatement to the lowest cost abatement and did not stimulate investment in new abatement opportunities. A market, NZU market being no different, requires depth and breadth of supply and depth and breadth of engaged parties and it is difficult to understand how the government interacting as outlined in Options 2, 3 and 4 will stimulate the market such depth and breadth is maintained or indeed enhanced.

6.3 Of the four options proposed, which one do you prefer? Why?

See 6.1

6.4 Are there any additional options that you believe the review should consider? Why?

See 6.1

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

NZIF believe the impact of this proposal has been negative to the forestry sector and the broader ETS itself.

NZIF is willing to engage on policies which enhance New Zealand's climate targets and support afforestation.

6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

NZIF has previously stated it will defer to Māori entities / Iwi to consider this aspect of consultation.

7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not ?

NZIF believe the exiting approach can be enhanced but only where additional removals enhance New Zealand meeting its climate targets. This consultation and these suggestion of changes to the ETS has already had a significant negative impact on participant confidence in the ETS.

ETS admission of future plantings with regard to cyclone challenged land or specific need based planting e.g., indigenous only, may be controlled better through the forestry models around approved projects for entry to the ETS and by the additional value which might be earned through a biodiversity credit system. Given the existence of this discussion document and confidence now in the ETS, on their own NZU prices will still be slow to attract the investment into large scale indigenous afforestation however, with additionally of biodiversity credits – if introduced and provided it can be demonstrated additional removals enhance New Zealand meeting its climate targets – scale of indigenous afforestation may become more attractive and feasible.

7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

NZIF comments already made at 5.4 and 5.5 are, NZIF consider any options which has the government as a buyer, or indeed the sole buyer, of NZUs as very low value options at best

7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?

Detailed cost-benefit analysis of the example options needs to be completed before support (or otherwise) can be given.
Given prior reform has had a primary objective of simplifying the ETS, any additional removal activities should only be considered if they can encourage meaningful quantum of additional removals, the removals can't easily be reversed and are simple to measure.

7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

NZIF would support credible mechanisms which enhance New Zealand's emissions profile and increase the likelihood of achieving climate targets especially New Zealand's Paris targets.
Detailed cost-benefit analysis of any other mechanisms needs to be completed before support (or otherwise) can be given.
Given prior reform has had a primary objective of simplifying the ETS, any additional other mechanisms should only be considered if they can encourage meaningful quantum of additional removals, the removals can't easily be reversed and are simple to measure.
NZIF observes and acknowledges increased afforestation when certain grant funding is available. Targeted appropriate grant funding has successfully afforested or remediated land in the past decade and NZIF would support re-introduction of grant-funding proving it was appropriately target, as one example certain areas where direct planting of indigenous afforestation or restoration may be appropriate however transition forestry may overall be more appropriate.

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Conclusions.

General.

In considering the discussion documents covering both the proposed changes to the ETS and the changes to afforestation models eligible for entry into the ETS, NZIF:

1. Registers its deep concern the consultation initiative has been pre-emptive of the final Climate Change Commission's recommendations, is limited in the transparency of the assumptions used to model and justify the proposed changes and lacks sensitivity and scenario iterations to better inform the discussion over what are proposed changes with very significant implications to the forestry sector.
2. The proposals come out at a time where some of the underlying justifying assumptions appear at odds with the current reality and are likely to be even more divergent post-election.
3. NZIF believe in the first instance, changes to the role of forestry in the ETS should be focused on the forestry models which are eligible, and once defined and operable, only then should further adjustments to the ETS be considered IF required and after further direct and detailed consultation with the sector which is the party most directly impacted.
4. NZIF believe before any final decisions are made, MPI and MFE need to establish a working group of knowledgeable and actively engaged sector specialists to refine and clarify the details surrounding any proposals. The lack of good faith consultation with the sector is and will be most significantly affected has been unwelcome.

ETS changes.

1. NZIF has been deeply concerned about the evidential base used to justify the proposed changes. The projections of new planting for permanent carbon forests seem uncertain even prior to the collapse of the NZU price and now seem highly likely to be significantly overestimated.
2. From national forest description data, NZIF believe NZ needs large areas of new planting of production forests under ETS averaging just to mitigate the emissions oscillations from the current plantation forest sink – the recent NZU crash and recently announced policy positions by political parties suggest the required targets will be seriously hindered before even considering any additional afforestation for formation of additional long term sinks.
3. NZIF contend more clarity and verification of modelling is required to make real assessments about whether the ETS and afforestation will consume all efforts to

reduce gross emissions and significant oversupply will crash the market in a short timeframe. This is particularly the case in the light of proposed forestry eligibility changes and restrictions.

4. The current assumptions and modelling in respect of total NZU supply from forestry and other sources and demand from emitters seems deficient in separating sources of supply from new (and recent past) averaged production plantations and new (and recent past) permanent forests and sensitivity forecasts re future planting from those sources. There also appears to be a disconnect between national objectives in respect of stabilising the production forestry sink, adding new removals capacity and consideration of the impacts of policy affecting large areas of forestry the subject of the government enquiry into land use post cyclone Gabrielle and Hale.
5. NZIF recommend changes to ETS market structure should be deferred until permanent forestry redesign policy is completed and implemented and at the very least clear undertakings be given should future changes be required, current participants will be grand-parented.
6. If at some future date changes to the ETS market are required changes should focus on restricting quantum (area) entered into the ETS rather than the market mechanism itself.
7. A potential for a future mismatch between supply (oversupply) and demand might be conceivable particularly if demand is deflated by subsidised emitter interventions and failure to bring agricultural emissions into the system. It is also conceivable under certain conditions, such a mismatch might occur in the market while targeted levels of planting to either or both stabilise the forest sinks or re-afforest eroding but low productivity hill country are not met. This would not represent a failure in the ETS but rather recognise its limitations and other mechanisms may still be needed in the future to meet climate mitigation and other national objectives.

General Comments

NZIF would like to thank you for the opportunity to submit on this consultation. We would welcome any opportunity to provide further clarification in relation to the points we have made in the body of this submission.

If you have any queries, please contact the undersigned.

Yours sincerely,

James Treadwell (Fellow and RMNZIF)
President
NZ Institute of Forestry
[redacted]

Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Pāremata

Submission on

Review of the New Zealand Emissions Trading Scheme Consultation

and

Redesign of New Zealand Emissions Trading Scheme Permanent Forest Category Consultation

To: Ministry for the Environment and Ministry for Primary Industries 24 August 2023

Submitter details

Parliamentary Commissioner for the Environment, Simon Upton
[redacted]
[redacted]

Parliamentary Commissioner for the Environment

The Parliamentary Commissioner for the Environment was established under the Environment Act 1986. As an independent Officer of Parliament, the Commissioner's role is to review the environmental management system. He has broad powers to investigate environmental concerns and make recommendations to improve environmental outcomes. The Commissioner is wholly independent of the government of the day. The current Parliamentary Commissioner for the Environment is Simon Upton.

Introduction

In my *Farms, forests and fossil fuels* report,[1] I explored some of the problems that I see with using forestry as an unlimited offset for fossil fuel emissions. I found that using forestry to offset carbon dioxide emissions was a poor match given the relative permanence of carbon dioxide in the atmosphere and the relative impermanence of forestry. In addition, given the sheer quantity of New Zealand emissions there was also a high likelihood of massive tracts of land being converted to pine forests. I concluded that there is a strong case for taking forestry out of the New Zealand Emissions Trading Scheme (NZ ETS).

In 2022, I looked at how much forestry would be needed to offset warming from agricultural methane.[2] I found that this use of forestry might be less risky as the lifetime of the cooling effect of a pine production forest is similar to the lifetime of the warming effect of the

[1] PCE, 2019. Farms, forests and fossil fuels: The next great landscape transformation? https://pce.parliament.nz/publications/farms-forests-and-fossil-fuels-the-next-great-landscape-transformation. Wellington: Parliamentary Commissioner for the Environment.

[2] PCE, 2022. How much forestry would be needed to offset warming from agricultural methane? https://pce.parliament.nz/publications/how-much-forestry-would-be-needed-to-offset-warming-from-agricultural-methane. Wellington: Parliamentary Commissioner for the Environment.

biogenic methane from a herd of ruminants. It could be an innovative way to manage New Zealand's agricultural emissions although it would require detailed work to bring to fruition.

I am addressing both the NZ ETS review consultation document and the redesign of the permanent forest category consultation in the same submission. The two are interrelated. It is important that officials working on each understand and factor in that interrelationship.

Despite many countries having net emissions targets, New Zealand is the only country that has carried that focus on net emissions into its carbon price (through allowing unlimited use of forestry offsets in the NZ ETS). Forestry's inclusion in the NZ ETS is causing a number of problems:

- It makes it difficult to achieve gross emissions reductions.
- A large stockpile of privately held units makes it harder for the government to control meeting its emissions targets using the NZ ETS.
- Multiple pathways for forestry's participation, its voluntary nature (for post-1989 forests) and constantly changing rules make unit supply (and demand) and levels of afforestation and deforestation hard to predict.
- Land use change driven by carbon price-induced afforestation is reshaping rural communities.

A review of the role of forestry in the NZ ETS is long overdue.

Review of the New Zealand Emissions Trading Scheme Consultation

Including forestry was one of the major design choices made when the NZ ETS was set up in 2008. Changing those settings now, including potentially removing forestry from the NZ ETS, involves a major adjustment that should be thoroughly thought through. Unfortunately, the execution of this review is well below the standard that would be expected of a good policy process.

1. While the consultation document canvasses some of the issues around forestry in the NZ ETS, it lacks a clear analysis of the specific problem or opportunity it is looking to address. This is important because the best solution depends on the problem definition. The one provided in the consultation document (such as it is) is unclear and potentially contradictory.

    - On the one hand, there is a stated desire to change the emphasis of the NZ ETS from reducing net emissions to reducing gross emissions. This desired change is presumably based on a concern that emitters will choose to purchase forestry offsets rather than take action to reduce emissions. This concern is reasonable given that forestry is likely to remain the marginal source of net emissions reductions for the foreseeable future, preventing the carbon price rising to the point where serious gross emissions reductions are made. Whether this is a problem though depends on whether the environmental outcome sought is a real reduction in gross emissions or an accounting outcome providing a temporary climate benefit by 2050, leaving real reductions for the distant future.

- On the other hand, there is a desire to continue to use the NZ ETS to incentivise removals, presumably to ensure afforestation continues to help meet New Zealand's net emissions reduction targets.

- At the same time, the consultation document also raises the opposite concern: that targeting net emissions by continuing to allow offsetting in the NZ ETS will lead to excessive afforestation (for which read massive land use change at the expense of social and economic options).

There is no explicit recognition that the two goals of gross and net emissions reductions – at least under the current NZ ETS – are in direct competition with each other. The consultation document seems to prejudge the problem as being a desire to promote a low-cost solution to emissions' mitigation (afforestation) without being as frank as it could be about the costs (massive land-use change extending well beyond 2050) or the risks of not incentivising gross emissions reductions. Without a clear problem definition it is impossible to set out a clear path ahead by supporting a particular option. Whether or not I agree with any of the options is a moot point – for serious public policy matters, specifying the problem is an important precursor to any solution.

2. Like any market-based mechanism, the effectiveness of the NZ ETS relies on providing adequate certainty to investors. This is especially relevant to forestry investments given the long timeframes typically involved. Some upheaval is inevitable when the fundamental design principles of a scheme that is the creation of public policy are placed in question. However, in my view the uncertainty created by this consultation has been larger than necessary and could harm the credibility of the NZ ETS in the longer term. A clearer problem definition and more detailed analysis of options, including the transition to any new system, would have helped reduce this uncertainty considerably. In the absence of these fundamental details, it is impossible to support any of the options provided.

   As an aside, the long-term credibility of the NZ ETS would also be improved by ensuring that the phase-out of free allocations for emissions-intensive and trade-exposed (EITE) industries continues and decisions are finalised on how to price short- and long-lived agricultural gases (i.e. through He Waka Eke Noa, or the NZ ETS or another mechanism). As pointed out in previous PCE submissions these exemptions cast a long shadow over the NZ ETS because the rest of the country needs to reach net zero in the 2030s to allow them to continue.[3]

3. Consulting on an NZ ETS review *and* redesign of the permanent forestry category at the same time increases the complexity of the exercise due to the number of possible permutations in play. This number becomes even larger when considering Cabinet's recent decision to bring other forms of sequestration into the NZ ETS and float a potential biodiversity credits system. It is unfortunate that the permanent forestry category was opened to planting in January 2023 without rules in place to ensure that it is effective in both encouraging afforestation and managing the significant risks those forest pose.

[3] PCE, 2023. Submission on the Climate Change Response (Late Payment Penalties and Industrial Allocation) Amendment Bill. https://pce.parliament.nz/publications/submission-on-the-climate-change-response-late-payment-penalties-and-industrial-allocation-amendment-bill.

Clarification of the problem/opportunity definition and what that implies for solutions

As noted above, the consultation document devotes insufficient attention to the problem, or the opportunity, that the review is aiming to address. In the absence of a clear problem definition the proposed options lack sufficient detail on which respondents to this consultation can rely.

In this absence, I lay out some thoughts on both potential problem definitions and potential solutions below. There are many different problems at play here and it will be very difficult to solve them all. The Government needs to carefully consider what it believes to be the crucial issue.

Problem definition 1: Incentivising gross emissions reductions and carbon dioxide removals using the same policy instrument makes the level of both difficult to control. This lack of control leads to uncertain or perverse outcomes.

Whether you think the NZ ETS should primarily deliver gross emissions reductions or you think there should be more control over the proportion of gross versus net emission reductions, the issues are similar.

The problem

Current NZ ETS settings favour net emissions over gross emissions because of the relatively low cost of abatement through afforestation. It is cheaper to purchase forestry offsets than reduce emissions in many situations. In those cases, afforestation is a rational business decision, at least in the short term. Some will claim that unlimited offsetting of emissions is not a problem. That is certainly the case if the outcome sought is an accounting one and a temporary fix.

However, forestry is like a climate credit card – we can get the benefit now, but it needs to be paid back in the future, with interest. While the argument that relying on cheap forestry now keeps the option open to adopt cheaper mitigation technologies in the future might make some sense, it is a risky strategy. This is how the original decision to adopt a net approach in the 1990s was rationalised – forestry would 'buy time' while awaiting low emissions technologies that others would develop. A generation on, it is hard to see what we have 'bought' with that time.

Under current settings, the Government is wanting emissions prices to climb higher to incentivise businesses and households to innovate and reduce their emissions, while at the same time welcoming forestry planting that will enable us to meet our 2050 target and emissions budgets. It is difficult to achieve both these goals simultaneously under current NZ ETS settings.

Potential solution

Perhaps the best way to solve this problem is to remove forestry from the NZ ETS and incentivise it using a separate mechanism (i.e. option 4),[4] as I have previously proposed (albeit for different reasons). My main concern with this approach is the increased complexity, investor uncertainty and scope for bureaucratic control that this option creates.

For those reasons, any proposal to remove forestry from the NZ ETS would need to be fleshed out in much greater detail, with much more thought given to how to grandparent or transition existing forestry participants. If the result of the consultation is that this is indeed seen as the agreed problem, it will require another round of consultation to come up with an appropriately detailed solution. This will only prolong the uncertainty around the NZ ETS.

If forestry were to be removed from the NZ ETS the following principles would be important:

- The transition from current settings to new should **honour the expectations of foresters currently in the NZ ETS**. One way to do that would be for the forests that are currently registered to continue to be used as offsets in the NZ ETS as per the current system. This transition would take decades but it is an important principle that rule changes should not apply retrospectively. We must retain investor confidence in environmental market mechanisms.

- Removing forestry from the NZ ETS would mean that auctions become a more significant source of unit supply into the NZ ETS market. The Government would have to decide how much of that auction revenue, or other funding, it wanted to expend on afforestation. The Government would need to **provide some long-term certainty over unit supply, including the expected quantity of credits that will be auctioned, and any price stabilisation mechanisms that would be put in place**. The Government has done this recently by accepting the Climate Change Commission's recommendations and future governments should continue to do so unless there are very clear reasons not to.

- **Provide investment certainty to forestry operators into the future**. This means giving clear and credible signals over the quantity of carbon that will be purchased and any environmental co-benefits the Government will prioritise in addition to sequestering carbon. I would encourage a tendering process that considered impacts on the local landscape, climate change adaptation, biodiversity and water quality. To do this well, however, would require high quality, granular data contextualised at a local level. For example, local areas need access to high quality physiographic maps of their soils and erosion risk. More research is also needed on the risks and benefits of alternative forestry species and management regimes, and how these compare to the status quo (clear-felled radiata pine production forests). Consideration of social and cultural benefits and impacts is also needed.

[4] Create separate incentives for gross emissions reductions and emissions removals. MfE, 2023. Te Arotake Mahere Hokohoko Tukunga Review of the New Zealand Emissions Trading Scheme. Wellington: Ministry for the Environment.

An alternative solution would be to limit the percentage of forestry units that could be used by emitters to meet their obligations (i.e. a subset of option 3).[5] This would give much more control over delivery of both gross and net reductions. The percentage could be adjusted relatively easily over time if the Government decided the NZ ETS needed to deliver either more gross reduction or more net reduction. Depending on the percentage set, there may already be sufficient forestry units in the NZ ETS to meet demand in coming years. The downside with this approach is that it would reduce forest planting long term, probably necessitating the creation of a separate afforestation scheme to meet our international obligations. There would be nothing to prevent this happening. While there would be some additional complexity and confusion of running multiple afforestation schemes in parallel, it is not unprecedented as we had and have a number of afforestation schemes outside the NZ ETS.

Unfortunately, the Government has never been clear about how much it wants to meet its targets using gross emissions reductions versus net reductions. This is a precursor to being able to structure the NZ ETS to deliver both gross and net reductions in the desired proportions. I am making a recommendation to that effect in my forthcoming review of the first emissions reduction plan.

Problem definition 2: Massive, permanent land use change driven by the cost of reducing emissions from activities that have no connection to the landscapes being planted will foreclose options that we may live to regret.

The problem

The spectre of landscapes covered with pine trees whose embodied carbon must be maintained *in perpetuity* has been raised by some, including myself, as a risky bet for the environment and one that forecloses many future options. Like most good slogans, "the right tree in the right place" contains an element of truth but is not a substitute for a clear way forward. The main implications are the loss of agricultural land, impact on rural communities and tangata whenua, and loss of option values to future generations who may need access to land for other uses in addition to the need for ongoing sequestration to offset truly hard-to-abate emissions. I am yet to see a comprehensive analysis of the scale of this risk. Ideally, such an analysis should go out to at least 2100 as New Zealand will need not only to reach but maintain net zero emissions of long-lived gases post 2050.

Forests only sequester carbon while they are growing, but the land needs to stay in forest indefinitely. That means that if we delay gross emissions reductions we will need to continue locking up more and more land in forestry. This problem needs to be balanced by the need to restore permanent forest cover to erosion-prone land for which there appears to be no realistic alternative use. While native trees may be the ideal for this purpose, I do not think we should rule out using exotics where appropriate to the local landscape. We need to be pragmatic and clear about what we are trying to achieve and the risks and benefits of different afforestation options.

[5] Strengthen incentives for gross emissions reductions by changing the incentives for removals. MfE, 2023.

Potential solutions

There are a number of ways to address this issue:

- Allow landowners to tender for the right to enter the NZ ETS (or if forestry were removed from the NZ ETS, tender to receive forestry subsidies) based on certain conditions. This mechanism could be used to control the rate of land conversion.
- Limit the percentage of forestry units that could be used by emitters to meet their obligations. While this would control the quantity of forestry, it would not control where forestry goes.
- The Government could also opt to solve this problem with a regulatory response by working with local authorities to zone the land as being appropriate for different types of forestry. While this is ostensibly the approach already being taken by this Government (via local authorities) and foreshadowed by the Opposition's proposed policy, I believe it could be done much more effectively (see my comments below).

Regardless of which option is chosen, there are a number of enabling investments that would need to be made to address this problem effectively.

Firstly, more central investment is needed to help local communities understand what should be planted where. For example, local communities need to understand the erosion risk of different types of forestry, as well as have better physiographic maps of land susceptibility to sediment loss. There may also need to be investment in developing markets for species other than pine, which has benefitted from large scale historical research efforts.

Secondly, to do this well there would need to be a significant investment in local capacity building (as has been proposed in respect of Tairāwhiti). Currently, the only institutions capable of undertaking this work are local authorities. In my view, to provide the enduring solutions our landscapes need, there should be a collaborative process that involves local communities and tangata whenua. Local authorities and iwi are not currently resourced to do this well. Long-term resourcing is needed to build the capacity of local institutions (e.g. catchment groups) to undertake this work. Developing this capacity could prove invaluable when it comes to addressing environmental issues aside from emissions reductions such as biodiversity, water quality and climate change adaptation. Talking about collaborative processes is easy. Making them effective is not. Local institutions would need to be able to make and enforce rules for this approach to be effective.

Cross-cutting considerations

Regardless of which problem or which solution is settled on, there are at least two critical cross-cutting considerations that should be addressed by the review: ensuring permanence; and exposing the distributional impacts both in the transition and intergenerationally.

Lack of forest permanence

We know that some of the carbon from fossil fuel emissions stays in the atmosphere for thousands of years. How can we know that the carbon sequestered in trees will do the same – because it must if the offset is to be a real one rather than merely an accounting device to fit an arbitrary deadline (such as 2050). As noted above, any forest planted for carbon offsetting needs to remain in perpetuity. It seems implausible that any government can provide such an assurance.

Future governments may decide that other land uses are more important. Fires, floods, windthrow, erosion, pests and disease pose increasing risks, especially for pine monocultures in a warming world. Insurance can play a part here (provided there is an ongoing source of revenue to purchase it) but we all know that in the case of extreme events the Government is the insurer of last resort and when its resources are exhausted, the environment itself is left to pick up the tab. Recent events in Tairāwhiti have thrown this problem into stark relief. What will happen on the land in Tairāwhiti that could be rezoned as having extreme erosion susceptibility and who will pay for it?

The 'permanence' risk may be relatively low for commercial production forests in the NZ ETS as there is an economic incentive in the value of timber for forests to be replanted. However, I am concerned by suggestions from some quarters that some of the forests that entered the NZ ETS just before the deadline to operate under the stock change rule (which was the standard before averaging was introduced) may become *de facto* permanent forests. There is no guarantee that they will be harvested and in fact with a high carbon price the incentive would be not to harvest and keep collecting carbon credits.

To address the permanence risk, a discount could be applied to monocultures such as pine to reflect the risk of fires, floods, windthrow, erosion, pests and disease. A tonne of carbon sequestered in a clear-felled pine production forest might, for example, only be worth 0.5 NZUs. Different discounts could be applied to different forest types relative to their risk.

This discounting would push up the carbon price (incentivising gross emission reductions) while still supporting removals generally (albeit less generously than at present). Such an approach could also help incentivise more diverse planting (e.g. natives) if that is a policy goal (again, the consultation document is not clear on this). There have been suggestions that natives could be encouraged through the creation of biodiversity credits but no one has yet explained what would incentivise demand for them. Without demand for the credits there will be no revenue stream to spend on native plantings.

The difficulty of applying such a discount would be accurately and fairly calculating the risk of different forestry types, particularly as it would also need to apply to other varieties of exotic forest such as eucalypts and even native forests during their initial stages. Research would be needed to find justifiable numbers. Even then setting the conversion factor would be politically contentious.

Distributional and transitional issues

The consultation document glosses over some fairly large distributional impacts. These are difficult to quantify without more detail on each of the options. These impacts require careful thought, which is one of the reasons that I believe industry operators require more detail on any options that the Government is proposing before committing to support any particular path.

If the NZ ETS forestry settings are changed, more detailed consideration also needs to be given to transitional issues for existing forestry participants. They will have invested on the basis of certain legitimate expectations and in some cases will have paid a premium for land into which the potential carbon returns had already been capitalised. Option 4 could not be supported if it retrospectively removed, without some form of redress, the rights of people who in good faith invested in forestry under NZ ETS conditions that could legitimately have been expected to continue. This would completely undermine any future attempt by government to create market mechanisms to solve environmental issues.

Generally, distributional issues boil down to a question of what is fair. Closing a commons – as we have done by removing the right to freely emit greenhouse gases – will always be difficult. As I have pointed out above, what is certainly *not* fair is changing the rules of the game midway for those involved. For those that have invested in forestry already, there needs to be a transition path laid out that honours their investment.

Fairness is inherently subjective and may not necessarily imply full grandparenting. For a variety of reasons, under current NZ ETS policy settings polluters are not paying the full cost of their actions. As a result, the Government – for which read taxpayers – faces an implicit future liability for the costs of reducing net emissions and adapting to climate change.

Anecdotally, as the price of carbon rose in 2021 and 2022, so did the price of Land Use Capability classes 6 and 7 land.[6] Purchases by forestry operators were effectively setting the price for marginal land. Looking forward, we want carbon prices to rise once again to reduce gross emissions. Based on what we saw in recent years I think it is important to point out that, under current settings, future carbon price rises are likely to lead to two, largely unintended consequences:

1. Higher prices for marginal land (Land Use Capability classes 7 and 8) make it more difficult for government, philanthropic groups or iwi Māori to purchase it to plant natives (or alternative exotic species). The costs of establishing natives are often higher and the return is lower and slower than it is for exotics. Higher land prices increase the opportunity cost of planting in natives.

2. Owners of marginal land will continue to benefit from large, unearned, untaxed capital gains. While whenua Māori benefit from carbon prices when they plant trees, they do not benefit from this windfall gain as their land cannot be sold.

An additional option worth considering

As previously noted, I believe that forestry offsets should not be used to offset fossil carbon dioxide emissions due to their extremely long lifetime in the atmosphere. I believe forestry could, however, play a role in offsetting agricultural emissions of biological origin.

As noted in *Farms, forests and fossil fuels* and my more recent methane note, there happens to be a rough alignment of the warming effect of ongoing methane emissions from a herd of ruminants and the cooling effect of a fixed area of pine production forest on a roughly 30-year rotation. This would suggest that the issue of potential misalignment between warming and cooling responses over time could be overcome to some extent by offsetting livestock methane emissions with pine plantation forestry at the national level. The fact that the cooling effect requires a fixed area of forest means that option values are maintained: a future decision to destock or move to animals with lower emissions would allow a compensating removal of trees.

I concede that this would be a major departure from the status quo, and pine plantation forests could only ever play a small role in offsetting methane at the national level. It is also difficult (but not impossible) to see how this concept could be used in the context of an annual price-based mechanism, or how the country would transition from the world we are in to that one. However, the same could be said for many of the options in the consultation document.

[6] See https://ourenvironment.scinfo.org.nz/maps-and-tools/app/Land%20Capability/lri_luc_main.

Recommendation

For the NZ ETS review consultation to yield meaningful information on how to redesign the NZ ETS, we need to be presented with a clear and definitive problem definition. If officials and ministers can settle on the problem definition, it should then be possible to provide more detail about the potential solutions. Based on the potential problem definitions I have canvassed above, the various permutations of options 3 and 4 seem the most obvious 'solutions' to which more detail could be attached.

I therefore recommend that further consultation be undertaken based on a document that has:

- a clear problem definition
- more detail around options 3 and 4
- details about possible transition provisions, with clear boundaries concerning retrospectivity and consideration of the potential need for redress.

Redesign of New Zealand Emissions Trading Scheme Permanent Forest Category Consultation

While the redesign of the permanent forest category consultation document more clearly articulates the objective of the consultation, it does so in an unbalanced way. The document overplays the benefits and severely underplays the risks of permanent forestry.

A risk management perspective is needed

As outlined above, a critical risk with so-called 'permanent' forests is whether they are indeed permanent. Key risks to permanence are fires, floods, windthrow, erosion, pests and disease. General neglect of the forest is also a key risk as there is no real incentive for owners to continue to manage the forest appropriately once any income stream from carbon credits slows.

While these risks are mentioned in the consultation document, they are done so almost in passing and in a way that seriously underplays their significance. For example, pests, weeds and disease are bundled into the *provide positive environmental outcomes* criterion. These risks are so significant that, at the very least, they should be specific criterion on which to judge the proposals. Ideally, managing risks should be a key objective of the redesign of the scheme.

If a risk management lens had been used to frame this consultation it would have been immediately obvious that the permanent forestry scheme needs very strict rules.

The rules should be very conservative in the quantum of credits handed to participants. I note that this is touched on to some extent in the discussion around option 2,[7] but in my view needs to be much stronger and more conservative.

[7] Create increased demand for removal activities to increase net emissions reductions. MfE, 2023.

It is important to acknowledge that at some point a permanent forest will reach a maximum long-term carbon stock. From this point on, the landowner will have to manage the forest in perpetuity with no further carbon revenue. Depending on what other sources of revenue might be available, the land underneath the trees could be seen as having little or no remaining financial value. From a carbon storage perspective this would appear to be a large liability that is not currently being addressed in the consultation. What if a fire were to burn the forest down in 50 years' time? How would tree re-establishment, to claw back the carbon lost, be financed?

In my view maintaining the ability to sustain ongoing forest management is a significant risk going forward and one that needs to be addressed carefully. One way to manage this risk would be through holding back some of the credits or requiring bonds. Interestingly, this was the requirement in California but recent fires have already literally burned through this contingency. The lesson to be learned is that any retention of credits or bonds will need to be quite large to appropriately manage the risk.

If the risk mitigation fails, liability will ultimately lie with the Crown. It may be worth considering whether permanent forestry is only allowed to be established on land under long-term stewardship– such as the Department of Conservation estate and whenua Māori. If it is allowed on private land it may be best to limit permanent forestry to a certain percentage of the land parcel and to land that delivers a range of other environmental benefits.

There is clearly a need for ongoing management of any forest, including permanent forests

I am currently investigating the risks and benefits of alternative forestry types in New Zealand, which includes examining the various types of forest currently being incentivised by the permanent forest category. While it is premature to say what this work will conclude, some general points that have emerged so far are worth noting in the context of the current discussion.

Permanent forests require long-term management that differs from production forestry and potentially lasts for centuries. Careful consideration will need to be given to how they are created and maintained, including how risks such as fires, floods, windthrow, erosion, pests and disease will be addressed over time. Crucially, this applies to all permanent forests, whether transition, exotic or indigenous.

While it may be hoped that an indigenous forest will slowly accumulate carbon for centuries, this may not always eventuate. Both the successional pathway and the carbon profile of some indigenous forests are uncertain. For example, under a passive management model it may take a hundred years or so for a forest to transition from kānuka and/or mānuka to taller tree species, if at all (this would depend on local seed sources and bird populations, local climatic conditions, site characteristics, pests and weeds, etc). This is notable from a carbon perspective, as both mānuka and kānuka are highly flammable and could fuel fires that disrupt successional processes and delay establishment of taller forests. Browsers and weeds can also present serious challenges to the establishment and long-term health of indigenous forests.

There is currently a cacophony of voices with various competing views on what should constitute a permanent forest, and whether permanent exotic forests should be allowed in the permanent forest category. Notwithstanding my comments about the risks of unlimited offsetting of emissions through large-scale pine afforestation, I am yet to form a view on what *types* of forest should or should not be allowed into this category. However, I would note that when appropriately located and well managed, permanent exotic forests can provide many environmental benefits.

Continuous cover forestry can provide a more environmentally sustainable method of timber production than clear-fell harvest and could be incentivised by allowing exotic forests into the permanent forest category under some circumstances. It could also provide an ongoing source of income to support the long-term management requirements of the forest.

The concept of 'transition forests' as described in the document is worthy of further investigation and research. But based on our limited current knowledge, we need to proceed with caution. I find it remarkable that the uncertainties around transition forests are repeatedly highlighted in the consultation documents and yet there is no option presented to apply the knowledge we do have to limit the circumstances (location, scale) under which transition forests might enter the permanent forest category.[8] Rather, the focus of the consultation is on how to manage them. While management is crucial, a precautionary approach would be to consider which sites are most likely to succeed.

From the limited knowledge we have, we know there are particular site characteristics that will either enable or limit the likely success of a transition from exotic to indigenous forest.[9] There is also limited evidence for how this process could work at scale. Solutions could include requiring the planning process for transition forests to have site pre-assessments to judge the likelihood of success, and considering limitations on land type and size. For example, in areas where success is deemed to be less likely, it may be prudent to limit this forest type to areas that would be suitable for production forestry. Then, should the transition fail, the forest could be moved into the standard forest category.

As noted above, there is anecdotal evidence that some of the rush of NZ ETS forestry registrations prior to the change to *averaging accounting* was driven by forests designed to be managed under *stock change accounting* rules as *de facto* permanent forests. I believe this risk should be monitored, ideally quantified and then any forests where it is found to apply should be made to follow the rules set for the permanent forestry scheme.

Regardless of which forests are allowed to enter the permanent forest category, each forest must have a management plan that adequately captures its purpose, intended pathway, proposed financing and management approach. The minimum requirements of each plan will vary with forest type, location and purpose. For transition forests that plan should include consideration of contingencies should the transition be unsuccessful.

[8] For example, "Consequently, establishing wide-spread transition forests presents an unknown degree of risk (Forbes 2021). Given these uncertainties, current best practice is to only plant transitioning forests in favourable environments, at smaller scales, and to actively manage the transitioning process." Ministry for Primary Industries, 2023. Interim Regulatory Impact Statement: A redesigned New Zealand Emissions Trading Scheme (NZ ETS) permanent forest category. https://www.mpi.govt.nz/dmsdocument/57289-Interim-Regulatory-Impact-Statement, p.18.

[9] Forbes Ecology, 2021. Transitioning Exotic Plantations to Native Forest: A Report on the State of Knowledge. A consultant report prepared for Te Uru Rākau – New Zealand Forestry Service by Forbes Ecology. https://www.mpi.govt.nz/dmsdocument/47521-Transitioning-Exotic-Plantations-to-Native-Forest-A-Report-on-the-State-of-Knowledge-2021-22.

Conclusion

It is unfortunate that registrations for the permanent forest category were opened prior to adequate rules governing the category being set. The backlash that greeted the Government's suggestion the category be limited to indigenous forestry is likely to be repeated if restrictive rules are put in place for the category. The Government will have to think carefully before conceding too much because meaningful and enforceable rules will be needed to manage the significant risks that accompany permanent forests.

Recommendation

The consultation should be reframed from a risk management point of view. The design options that are then consulted on should address each of the risks identified with appropriately strict rules.

Concluding comments

Having both rotational and permanent forestry in the NZ ETS creates significant risks to New Zealand being able to reduce gross emissions. Only if meeting emissions reduction targets is regarded as nothing more than an accounting exercise, is their ongoing inclusion justified – and even then, the option values at stake for land use and many provincial communities are not negligible. If contributing to global action on climate change through reducing emissions is the policy goal, then the role of forestry offsets can only be ancillary and their risks need to be properly managed.

Neither of these consultation documents adequately identifies or quantifies the risks. Neither do they adequately propose solutions to manage and mitigate them. Some serious reworking needs to be undertaken in respect of both consultations if they are to yield meaningful results.

Simon Upton

Parliamentary Commissioner for the Environment
Te Kaitiaki Taiao a Te Whare Pāremata

Proposals to redesign the permanent forest category in the New Zealand Emissions Trading Scheme

Submission by [redacted].
[redacted] , relating to exotic trees in permanent forests in the NZ ETS.

Background. I am not a professional forester nor a farmer, but for 30 years I have managed the family forestry exercise of 50 hectares in North Auckland. The family also have owned for over 60 years some 20 h of virgin bush on the northern edge of Fiordland National Park. (an area of a failed settlement of the 1860's). I am a member of the Farm Forestry Association, whose members have a wide range of forestry interests, & of Tanes Tree Trust, which focuses on the management & promotion of native trees.

In this submission I give a few references, but generally any figures/claims made, or terms used (such as "planetary boundaries') can be readily confirmed or explained with a Google search.

My position is that permanent exotic forests have an important place in our transition to a stable climate & overall environmental sustainability - that is, living within the limits of a finite planet.

It needs to be said that in most discussion of exotic trees, the assumption is that it is about *Pinus radiata.* This is so in the media, & even with professional foresters. There is much more to exotic forestry than radiata.

1. I start by addressing the propositions that permanent forests in the ETS should be limited to native forests or exotic forests transitioning to native forest over time. The transitional time frame generally given is around 50 years.

I think these propositions are misguided, for several reasons. Firstly, the official figures for forestry cover of NZ are about 10 million hectares of which 8 million is native forest (>30% of NZ land area)") & 2 million is exotic forestry. That is, we have a very substantial area of the country still in native forest, an abundance in fact. The problem is, we don't look after it. It is riddled with pests, from the larger (deer, pigs, goats, wallabies) to the smaller (possums, mustelids, rodents etc), which impact both native flora & fauna. An indication of the size of the problem is seen in the latest reports of two conservation groups with which we are associated.

In the north we have the Forest Bridge Trust, whose ambition is to establish a predator free zon

across the Auckland isthmus north of the city. About half of this area, taking in the Kaipara hills & Hoteo river catchment, has a high level of forest cover. The report for just the last 3 months of 2022 lists the trapping of 1228 possums, 242 mustelids, 2015 rats, & 662 sundry (mice, hedgehogs etc.)

I will add that our own forestry block is bisected by 9 h of native bush & wetland. When we purchased the property 30 years ago the bush had been mauled by generations of previous owners' cattle. There were mature but unhappy trees, with no understory, just bare earth.The first thing we did was to fence off the bush, & when the grazing lease ran out in a couple of years, removed all stock from the property. We carry out an active control programme for possums & mustelids. We now have a fine stand of bush with luxuriant understory.

In the south, in northern Fiordland, we became concerned some years ago with the decline in the general health of the bush, & in the bird life. Along with others involved with the area we set up the Hollyford Conservation Trust. We run an ongoing pest control programme. Deer numbers are now reasonably controlled by hunters, pigs have been eliminated, & there are no goats. I don't' have the latest record for possum numbers, but the annual report for 2022 records 338 mustelids & 756 rats

trapped. The resurgence in the bush understory & in the bird life, over the decade of the Trust's work, is very evident.

These reports from opposite ends of the country illustrate the extent of the pest problem.

My point is, rather than promoting the establishment of native, or of transitional forest - a concept little studied, but known to be expensive & difficult, which in area is likely to be trivial against what we already have, & which will suffer the same plague of pests - we should first of all put far more resources into the health of the existing native forest.

2. Related points

a. A native forest is slow growing & thus slow to take up carbon. We are in an accelerating climate crisis (ref 1) & as one of the tools in reducing atmospheric CO2 is absorption by trees, we need them to grow quickly.

b. Fifty years is generally given as a suitable time frame for transition from exotic to native. Here there seems to again be the assumption that radiata - a relatively short-lived (100 years or so) non-coppicing tree - is exotic forestry & vice versa.

Some exotics live far longer - more than 300 years for some species of eucalyptus (ref 2) or over a 600 years for redwoods.. Requiring such species, full of carbon, & with large environmental advantages (see below), to be largely eliminated from a forest within 50 years does not seem sensible - & indeed, with coppicing species, impractical.

c. The place of forestry & the type of tree to plant goes beyond just climate & the sequestration of carbon. It is part of the issue of long-term environmental sustainability & keeping within planetary boundaries. To achieve this there must be a focus on maximising recycling of materials & minimising the production & use of non-recyclable material. This begs the question of what is truly recyclable.

The views of a chemical engineer at Waste Management, who has worked on landfills for 15 years, are illuminating (ref 3).They are chillingly summarised in his comment: *"The more you know about waste, the less well you sleep at night,"* he says. *"We have less than 20 years to sort this…"* He makes the point that only natural materials, made from plants or animals, are truly recyclable.. *"There is no good news regarding fossil fuel-derived synthetics. Exposed, atmospheric oxygen and sunlight will degrade all synthetics (through chain length*

shortening) eventually to CO2." And *"There is an intellectual deceit with 'recycling' of plastics; just because there is a second use for your material or you are using a 'recycled' material does not matter. It is twice as good [as using the plastic only once], but it is still unsustainable."*

The relevance of these comments to forestry is evident: wood is a fully recyclable natural product which should be used wherever possible.

d. However not all wood is created equal. Some is naturally very durable (defined as heartwood lasting more than 25 years in the ground)) or durable (15 years). Above ground, these will last, at a minimum 50 years, & generally much more. Native species such as totara & broadleaf (*Griselinia littoralis*), & exotics such as some eucalypts are durable or very durable. But here again is that problem of growth rate. Our eucalypts achieve a diameter in 10 years that our totara will struggle to achieve in 50.

Radiata, the dominant exotic, is not durable, lasting less than 5 years in the ground**.** To deal with this limitation, for outdoor use it is commonly treated in NZ using a chemical concoction of copper, chromium & arsenate (CCA). This is used widely & rather casually in NZ Its use has been prohibited or greatly restricted in many countries (ref.4). In the USA since 2005 it has been restricted to industrial use. It is not recognised

as a wood preservative in the EU. Japan prohibits its use. Australia prohibits its use in domestic & residential situations. The boron treated wood used for interior framing in New Zealand has the same limitations as the CCA product. (There is an environmentally friendly acetylation method for preservation of radiata, but it is energy intensive & expensive. There are no facilities for it in New Zealand.)

The toxicity of these chemicals eventually & inevitably creates a disposal problem. It cannot - or rather, should not - be burned, as the chemicals are either released into the air or remain in the ash. There is simply no cheap, safe & effective way of disposing of the treated wood when it breaks or becomes redundant. In the wine industry alone, thousand of poles are broken each year. Official advice regarding disposal of treated radiata amounts to “take it to the local municipal dump" -where it will leach the toxins for many years.

For these reasons, naturally durable, fully recyclable wood is needed. Widely planted & thriving in NZ, some species of Australian eucalypts admirably serve that purpose. They have minimal tendency to spread as wildings, They grow vigorously, coppice well, & thus can be selectively harvested for many generations, This is continuous cover forestry, as opposed to the traditional clearfelling practised in NZ.

(As a bonus they can host a rich native understory). We are seeing good progress in this area, with the expanding Drylands Eucalyptus project in Marlborough.

e Clearfelling of a forest at generational intervals (<30 years with radiata) creates two major problems.

The first & more obvious is the vulnerability of the exposed soil to erosion, as seen in Te Tairawhitu this year - along with the detritus of harvesting slash, This has been an environmental catastrophe which will take several (human) generations to fully mend. The problem is less with the tree species - radiata - than with the practice of clearfelling, which is mainly done for economic reasons. It is cheaper, & therefore more profitable, to harvest everything at once.

The second is the impact of modern heavy harvesting machinery on vulnerable soils: this is particularly noticeable on the heavy clay soils of much of Northland. Soil compaction, amongst other effects, reduces the ability of soil to both take up water & retain water, & hinders penetration by roots. Three years after our own harvesting, we have several hectares where the soil has been so damaged that it is still bare, nothing has yet grown.

In both these situations, of vulnerable terrain & vulnerable soils, the land is best protected by

permanent (continuous cover) forestry, with limited, selective harvesting, with light equipment, & within the parameters of the ETS. In parts of Europe this has been the sustainable forestry practice for centuries.

f. I am not suggesting that a wholesale planting of eucalypts or any other exotic species should replace radiata, nor that a transition of some exotic forest to native forest is not a desirable goal. In places it is. It would be marvellous if some such transition were eventually achieved in the rehabilitation of parts of the Te Tairawhitu. But I think the process will be difficult & the time frame is more like 100 years. Rather, my point is that some exotic trees have an important contribution to make in our transition to a sustainable existence on the planet. .

g. Forestry requires long term planning. Any decision will have an effect for many years. This is not compatible with recurring changes in regulations. In this respect the short history of the New Zealand ETS is rather sad.

In summary:

1. We have an abundance of native forest but we don't look after it

.

2 Over-promoting the planting of native trees, or exotic to native transition, is a distraction in dealing

with climate change & environmental degradation. Time is short.

3. Wood is a natural, fully recyclable material. Appropriate exotic tree species can make an important contribution to achieving environmental stability on a finite planet.

4. In some regions clearfelling can be disastrous for the soil. Such regions/soils are better served by permanent forests, ie: continuous cover forestry with selective harvesting within the parameters of the ETS. Fast-growing exotic tree species have a major place in this scenario.

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Red Stag Group Submission:

Te Arotake Mahere Hokohoko Tukunga Review of the New Zealand Emissions Trading Scheme

11 August 2023

About the submitter:

Red Stag is a vertically integrated forestry, sawmilling, engineered wood processing and proper development group of companies. It operates the largest sawmill is the Southern Hemisphere and New Zealand's only Cross Laminated Timber (CLT factory) At $300m, it has been NZ's largest investor in new wood processing during recent decades. It is based in Rotorua and has over 500 staff, of which approximately 50% are Māori. Red Stag thanks the government for the chance to make this submission and hopes its vertical industry exposure is of assistance to the formulation of effective policy and regulation.

Consultation Options Feedback:

Option 1 – Red Stag supports, with modifications (see below)

Option 2 – Red Stag supports

Option 3 – Red Stag strongly disagrees

Option 4 – Red Stag strongly disagrees

Discussion:

The ETS is designed to be an emissions trading scheme, and Red Stag agrees that it has faults in its structure that are resulting in lower pricing projections and therefore lower gross emissions. The government is right to review it, but Red Stag does not consider the four options being consulted on are the best recipe-set.

The ETS is designed to set the price of emissions in New Zealand. It is a marketplace made up of:

1. Demand for NZUs – from emitters

Supply of NZUs – from:

a. Government auctions
b. Industrial emitters that get free allocations
c. The stockpile of units
d. Storage/Reduction of emissions (currently via forest NZUs, but expected to include Harvested Wood Products (HWP) as discussed further below).

The issue appears simple; there is too much potential NZU supply such that the Carbon Price will not increase, and emitters have no incentive to reduce gross emissions. With respect, Red Stag's view is that the solution is also simple; reduce the potential supply of NZUs. The challenge is how to do that.

Firstly, we suggest identifying what cannot be touched. This includes:

- The **Stockpile of units** – these are a property right.

- The **forestry units earned and to-be-earned from forestry establishment already invested in ETS registered forestry, or established in 2023-2024** (timing delay), including permanent forestry. (d above) Investment decisions based on income assumptions for decades have been made in trust and reliance on government not changing the rules affecting these in the ETS, as proposed in Options 3 and 4. The previous government changed the ETS and collapsed the market by allowing use of Kyoto units locally, severely damaging the confidence in the local forestry investment sector. That confidence has been long and slow to recover. Any repeat would be fatal to the ability to meet net emission targets using forestry, and therefore New Zealand's climate goals and NDCs.

Next, Red Stag suggests reviewing the supply volume from **Government auctions**, **Free allocations** and **post-2025 established ETS registered forests**.

We suggest the government start by establishing the ETS carbon price it considers will result in gross emissions.

Then, manage the 3 supply-side NZU sources immediately above, as well as HWP NZUs, between now and 2050 as follows:

1. Phase out the **free allocation** far quicker (by 2030) and constantly review the changes to international competitor emission costing by sector to improve on the reduction profile.

   It makes no sense complaining that emitters are not reducing gross emissions, but then gifting them valuable free NZUs that mean they don't need to reduce emissions.

   A steeper shorter phase out of free allocations would send the message that they are being weaned off this subsidisation and will need to decarbonise. Introducing the Carbon Border Adjustment Tax on international competing suppliers (as the EU is doing) would alleviate the need for free allocations. The Carbon Border Adjustment Tax could then be applied to the 'Climate Emergency Response Fund' (CERF) to replace part of the revenue from auctions (see below)

2. Significantly reduce **Government Auction NZU** volumes and eliminate them in the next 3 years. Government NZUs are not based on actual emissions reductions (they are "hot air units") and so have no part in a pure marketplace for emissions and reductions. They distort the market and are having the effect of not reducing the Stockpile of units but are reducing the Carbon price.

   Unfortunately, the government has made commitments from the CERF which it will have to fund elsewhere. If it wants the ETS marketplace for supply and demand for emissions to work properly there is no place for artificial hot-air supply-side volume.

3. Based on the above, then model the forest establishment volumes from 2025 onwards that will deliver the target Carbon price profile required to reduce gross emissions. Based on that, restrict the hectares of exotic forestry that can be registered into the ETS each year. Restrict ETS land to properties with predominantly higher Land Use Classes (eg properties that have at least 50% of the land in LUC 6 or higher, with any shortfall of the 50% made up for with new native establishment).

We favour a simple ballot-type allocation system, open to entities with a proven track record in such investment. An allocation for iwi land may be a component. To allow time to conclude land transactions and plan planting, the ballot should conclude 18 months ahead of the planting winter.

4. Model the volume of HWP NZUs attributable to wood processing in New Zealand of long-life wood products. These will be significantly less than the forestry reduction NZU volumes, but are more valuable to New Zealand in these ways:

    a. HWP calculations incorporate the substitution impact of steel and concrete which represent gross emission reductions. This drives the gross emission reductions the government seeks. The NZ Steel arc furnace will reduce emissions in half of the Glenbrook steel plant volume, but not the other half which needs either abatement or substitution. Further, NZ Steel produces two-thirds of NZ's steel needs, the rest is imported, typically from Asia with full emissions. The arc furnace only covers therefore one-third of emissions from NZ's steel use. HWP products will substitute out much of these remaining gross emissions. The scenario is similar with concrete substitution. Concrete NZ has issued a pathway to net-zero in 2050, but this requires research into solutions, making that pathway inherently uncertain and risky. In the meantime, concrete's gross emissions can partially be substituted out through use of HWP products such as Cross Laminated Timber (CLT). This will both lower NZ's gross emissions and reduce the government's bill for missing the NDC reduction targets in 2030. Concrete's emissions are around 150,000 tonnes annually, which adds to the NDC shortfall if not substituted out where possible.

    b. Encouraging HWP production effectively means NZ stores forestry carbon for <u>longer</u> to achieve its carbon budgets and does not need to plant as many hectares of farmland in exotic forestry. Politically and economically, this is a win-win outcome for New Zealand. The HWP scheme design can be such that the qualifying HWP storage can effectively be permanent - again, with the correct design approach.)

    c. The addition of HWP NZU value to wood processors will add a <u>secondary income stream</u> that will trigger up to $1.5 billion investment. This will transform the sector into a major producer of the sustainable building materials needed to reduce the ~10% on NZ's CO2 emissions attributable to building materials and construction.

    d. Modelling in conjunction with Scion shows that if HWP value is divested to wood processors in the same way forestry NZUs value is attributed to foresters, the following outcomes can result:

    - **Additional 3.1 million m3 Harvested Wood Products produced**
    - **Additional 7,700 direct employment** – mainly rural and – in Red Stag's experience – 50% Māori
    - **Additional 3.5 million tonnes of logs processed domestically** – drastically reducing reliance on the declining Chinese log and construction market which is now a major threat to forestry
    - **Additional $1.56 Billion in wood processing investment**.
    - **Additional 350,000 tonnes annually in additional biomass generated** at wood processing sites (the most cost-efficient to collect)
    - **Additional 1.5 million tonnes CO2 stored annually** from the additional harvested wood products M3 produced.

- **Additional 3.6 million tonnes of CO2 stored annually once the product substitution component of HWP is incorporated**.
- **Reduced farm conversion - above storage is equivalent to 114,000 hectares of farmland converted to Radiata Pine**, or
- **526,000 hectares of farmland converted to Native** (saving $11.57 Billion)

The modelling above assumes HWP value is divested to wood processors and the government fully implements its 'Building for Climate Change' regulation and lowest carbon building procurement policy. For more on this, please see the Climate Commission submission included: 'Red Stag Group Submission on: '2023 Draft advice to inform the strategic direction of the Government's second emissions reduction plan April 2023'.

HWP value has long been expected to be divested to wood processors, and some wood processors have invested to produce more on that basis. It is now included in NZ's NDC calculation. In 2019 the Forestry and Climate Change ministers instructed MPI and MfE to develop a scheme to distribute this value to wood processors and reward investment in more HWP. This initiative forms part of the Forestry and Wood Processing ITP, and MPI now has consulting firm Martin Jenkins working on the policy. The Climate Commission's latest consultation noted that it is open to including HWP value in the ETS and is awaiting MPI's policy development.

Summary:

Red Stag would like the government to address the supply-demand imbalance on the ETS by re-orienting it to a pure marketplace for emissions and actual reductions. Aggressively phase out free allocations and government auctions, and then engineer the post-2025 Forestry NZU and HWP NZU volumes to achieve the required Carbon Price.

Response to MPI/MfE discussion on proposals to change forestry settings in the New Zealand Emissions Trading Scheme

Ben Liley

In the past I have been a full-time sheep and beef farmer, and I retain farmland and interest in that industry. I have also planted and tended extensive woodlots of *Pinus radiata* and other exotics. I am registered with the ETS as a forest owner, though none of my suggestions are motivated by self-interest. For over 30 years I have worked for NIWA, almost entirely as an atmospheric scientist at Lauder, a research station studying atmospheric composition and its interaction with solar radiation. The ideas below are informed by all the above experience, but the opinions are entirely my own.

This submission restates my position on the 2022 PFC review, with some additional thoughts. At the end, I address the questions raised in the 2023 PFC discussion document.

I very strongly take the view that exotic forest should be excluded from the permanent forest category (PFC) in the ETS. Further than that, I suggest that the ETS should be split to reflect the short- or long-term nature of both forests and the greenhouse gasses that they sequester. All long-lived GHG emissions (CO_2, N_2O, SF_6, some HFCs) should only be offset with permanent native forest. Short-lived exotic forest, especially *P. radiata*, should be used in a separate ETS to offset agricultural methane. The prices of the respective units could then be decoupled to properly incentivise elimination of fossil fuels without undermining the economics of both farming and production forestry. Transition forests would simply migrate from one category to the other over time.

These ideas are expanded below.

Exotic forest should be excluded from the permanent forest category in the ETS

New Zealand has a long history of allowing exotic plants and animals to overrun the country, and *P. radiata* or other exotic trees should not be added to the list of shame. *Pinus contorta*, larch, and Douglas fir are already a major problem on the hills of Central Otago where I live, and *P. radiata* is no less of a weed in the wrong place. Large areas of exotic forest should not be permanent, and they certainly should not be encouraged by the permanent forest category (PFC).

Within farms, parkland, or similar managed areas, long-lived exotics (e.g., redwoods, oak, etc.) are welcome. The key point is that all exotic species (plant or animal) should be managed and controlled where necessary. Only indigenous forest should be allowed to grow and evolve unsupervised, and even that requires intensive control of pests and disease.

Carbon pricing is a problem for agriculture globally, and worse in New Zealand

Globally, there is oft-repeated mythology that growing crops for biofuels is inflating food prices. The energy content of a 60-litre tank of petrol is about 2 GJ, or 476,000 Calories (kcal); enough to feed an adult male for six months. Nowhere in the world can you buy six months' food for less than the cost of 60 L of petrol, and that is before all the losses of converting food to liquid hydrocarbons. Only by subsidising crops for biofuel production are food prices affected, moderately, by diverting supply.

The economic effects of carbon charges, if levied on agriculture, are quite different. There, the relatively minor increase in the cost of fuel from ETS or carbon taxes is set against just the fraction of food prices that goes to the farmer. A carbon charge of $100 per tonne of CO_{2e} adds just $0.22 to the cost of a litre of petrol (whether US$, NZ$, or €, the charge is proportionate); a minor expense

compared to the variation with world events. The same $100/tCO_{2e}$ would cost $37 per sheep or $200 per cow grazed on pasture, and more for animals in feedlots, just for the methane. It is not just in NZ that such costs would be totally unsustainable.

At the same time, the returns from carbon forests, especially with no tending costs, can be much higher, as has been much discussed in the UK and Europe. In NZ, the problem is especially acute. We combine relatively low returns to farmers per unit of primary produce with some of the highest available rates of forest growth and carbon capture.

This leads to the figures on page 12 of the MfE/MPI 2022 discussion document, which at $100/tCO_{2e}$ would give an investment return (NPV over 50 years) of NZ$40,000 per hectare for permanent exotic forest vs a ninth of that return for sheep and beef farming. That obviously does not include any levy for agricultural GHGs, which could quickly make the farming returns negative. As the discussion document notes, even dairying could scarcely compete, and it certainly couldn't if levied for ruminant CH_4 and pastoral N_2O emissions at the same carbon price.

Farmers need to acknowledge the value of production forestry

The above issues have been widely canvassed in the farming press, especially in a series of well-informed articles by Keith Woodford, but I believe the response of most farming leaders is misdirected. There continues to be a great deal of 'aggro-forestry' – the angry reaction many farmers have to any exotic forestry. This needs to change.

I strongly commend the MPI/MfE discussion document for its very good comparison of the three land uses in Table 2; permanent exotic forest vs production forestry vs sheep and beef farming. Farmers have been too insistent on the virtue of their export earnings, ignoring those from forestry. As the discussion document figures show, sheep and beef farming earned nearly twice as much export revenue as forestry in 2020 ($10.7 billion vs $5.5 billion), but from more than five times the land area (9.6 million ha vs 1.74 million ha). This 1:3 ratio is reflected in the GDP contributions as given in Table 2; they are about 52% larger but in the same proportion.

What is especially interesting in Table 2 is that forestry employs more than twice as many FTEs for the same land area as sheep and beef farming. The objections some farmers have made to forest establishment, that it diminishes farming communities, has some truth in that many of the forestry FTEs are in larger centres and are intermittent rather than continuous. Against that, huge reduction in rural population has occurred throughout NZ's agricultural areas regardless of any forest planting. It is a consequence of many things including farm aggregation, faster and easier travel from population centres, but mostly from the increasing average age of farmers who are now predominantly over the age where their children are at home.

While the ETS and PFC changes are predominantly motivated by considerations of climate change and economics, they should where possible seek to alleviate the concern about rural communities. Production forest workers, and especially those needed for permanent indigenous forest (establishment, tending, pest control), could boost numbers living rurally and perhaps improve farmers' view of forestry.

Carbon forestry is a problem for production forestry

When the ETS was first developed in the 2000s, it appeared to help with the dominant economic concern with forestry; that almost all investment is in the first few years, but returns are much later. Land purchase, clearing, planting, release-cutting, pruning, thinning, high-pruning, and more

thinning are all typically in the first decade, but harvest is after 25-30 years (for *P. radiata*). The problem was made worse in the 1980s by a change to tax rules so that costs could only be carried forward for a given block rather than used to offset income on other blocks.

The ETS created an ongoing revenue stream, albeit with the need to repay it on harvest. For much of the time since its inception, NZUs have been worth far too little. Now, they are worth too much but, according to the Climate Change Commission and the Productivity Commission, as well as international commentators like the International Energy Agency, they need to go much higher, to over $\$200/tCO_{2e}$.

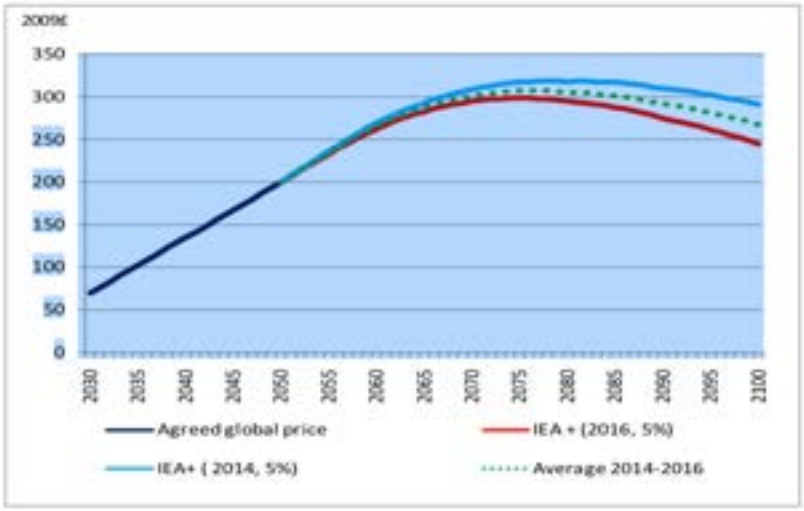
High prices for carbon sequestration are a problem for production forestry as they make it uncompetitive with permanent exotic forests, if both qualify. The above figures from page 12 of the discussion document show that $\$100/tCO_{2e}$ giving NZ$40,000/ha for permanent exotic forest is twice that for production forestry. That might seem to offer flexibility, as the permanent forest could subsequently be felled if prices change, but it is misleading.

As noted, most the costs for well-managed forest are in the first decade, and if the work is not done the mature forest has much lower value, both in the reduced value of unpruned logs and in the effects of constant stocking rates. There is also higher risk from fire, disease, and erosion. Unless there is an established and enforced plan to evolve exotic forest to indigenous, exotic forests need to be managed for eventual harvest.

NZU prices are not permanent, and may fall markedly in future

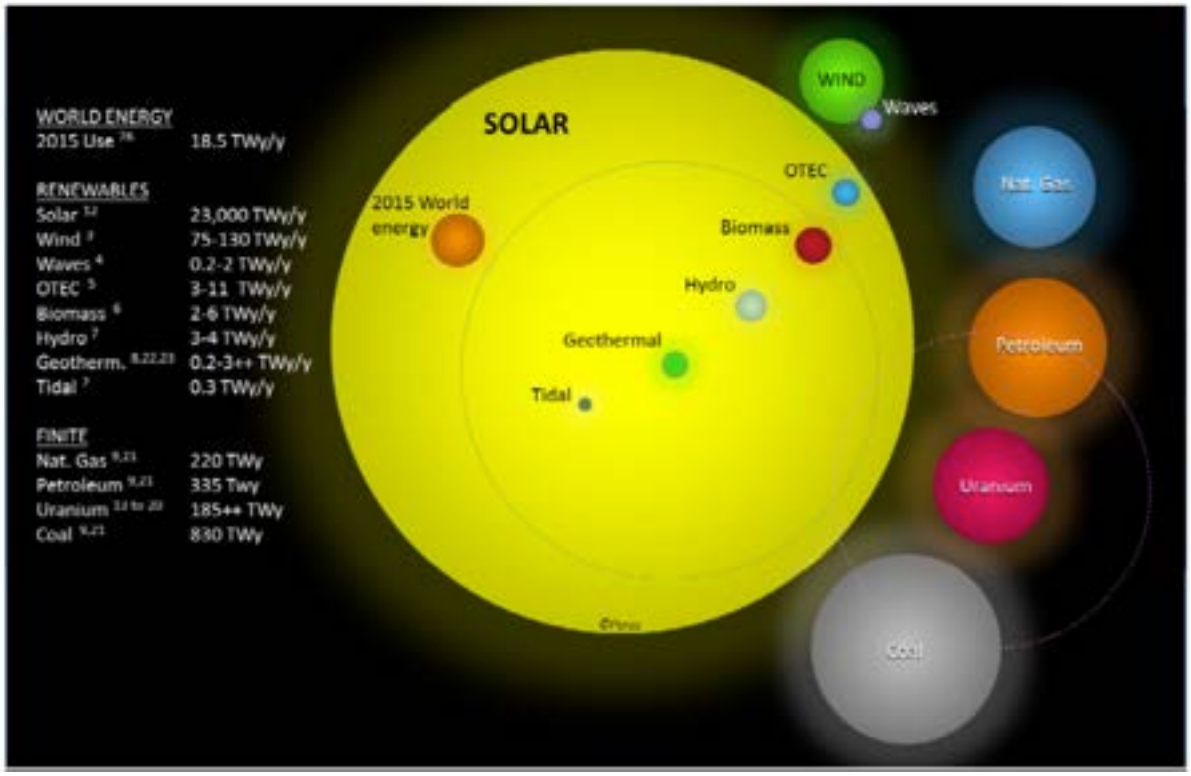
One topic where I have struggled to find published work is the expected future price of carbon beyond 2050. Many reports (BNEF, IEA, etc.) project steep rises through to 2050, and a report from the UK Department of Energy and Climate Change envisages continued rise beyond that time, but a turnover around 2075 and subsequent fall, as illustrated here:

Chart 7: Estimated carbon values (2030-2100)



https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48108/1_20100120165619_e___carbonvaluesbeyond2050.pdf)

I believe it could happen sooner than that. Although climate change from GHG emissions to date is locked in for centuries, so that there is ongoing value to humanity in sequestering carbon, there may be few sectors still able or willing to pay. If all the world's present energy consumption (~20 TW) were to be met from fossil fuels, known reserves (830 TWy coal, 335 TWy oil, 220 TWy gas) would be exhausted in 70 years:



https://www.iea-shc.org/data/sites/1/publications/2015-11-A-Fundamental-Look-at-Supply-Side-Energy-Reserves-for-the-Planet.pdf

Long before then, declining production will force all industries to move to renewables (almost entirely wind and solar, as above), with perhaps some greater use of nuclear energy if breeder technology or new developments expand it beyond 185 TWy. Whatever our new energy sources, burning of fossil fuels would reduce to very low levels regardless of the need to eliminate them to counter climate change. With most countries in the world now endorsing a carbon-zero future by 2050-2070, there will not be any large consumers of fossil fuels by 2050.

This might sound like wide-eyed optimism, or even an argument against action on climate change. It is neither, as in fact the world must use only a fraction of fossil fuel reserves, but that just emphasises the point. By 2050, there will be a global dearth of buyers for carbon credits, and prices for carbon sequestration may collapse.

When that happens, NZ can completely reconsider its land use, at both individual and state level. If carbon prices will be very high for a few decades, but then fall to low levels, it would make sense to plant a much larger area of the country in forest for one or two cycles. It might subsequently be cleared and returned to pasture, as has happened extensively in former forests of the Central North Island around Reporoa, Tokoroa, and Whakamaru. Exotic forest needs to be viewed as a very valuable and versatile crop, but one that must in time be harvested like any other.

We should have a second short-term ETS which can then include agriculture

Carbon dioxide, nitrous oxide, sulphur hexafluoride, and some other GHGs are a long-term problem, and they should have correspondingly long-term solutions. Permanent indigenous forest is one, but it is expensive to establish, and it requires a significant commitment to control of pests and disease (e.g., *Phytophthora*, PSA). It is also slower growing, requiring a higher carbon price to be affordable. These factors make it the ideal target for ETS prices that might soar beyond \$200/tCO_{2e} by 2030; indeed, they should be encouraged to do so to disincentivise fossil fuel consumption and pay the full

cost of indigenous forest establishment and care. To help the ETS price go there, it needs to be decoupled from both agriculture and production forestry.

As the figures in Table 2 of the 2022 discussion document show, production forestry can readily survive on its own merits, notwithstanding two issues. One is the high price of land, even before carbon forestry. Farmers will pay $6 million for a farm and livestock that requires them to work 6-7 days a week for less than 2% return on their money before even paying their own wages. That has worked because the money is more than inflation-proofed by capital gains realised on sale.

This model has been ruinous for the farming industry, so that only a trickle of young farmers can enter the industry, and farm operations are starved of returns for improvement even as the money is saved to be spent on McMansions in retirement. It is worse for production forestry, where return on investment is measured in dollars rather than lifestyle. Under present CCRA, this toxic situation is exacerbated by the possibility of carbon farming with up to twice the returns per hectare of production forest, or nine times those of agriculture. Certainly, this must be changed by removal of exotic forest from the PFC. I suggest removing exotic forest entirely to a separate methane emissions trading scheme (M-ETS), with a managed unit price.

At around $25/t$CO_{2e}$, the returns from exotic forest grown for future harvest provide a revenue stream to cover all establishment and tending costs, and a return on land purchase or rental under a forestry right. With a controlled price, it does not even need to be managed under averaging rules, but could simply be paid for every year the trees grow, at their then rate of sequestration.

A carbon price of $25/t$CO_{2e}$ would mean an average liability for CH_4 emissions of $8 per sheep or $45 per cow if paid in full. In the past, I have suggested they could be discounted by a credit for protein production, which would add perhaps $0.80 per kg of meat, but even without that the cost is almost affordable on some recent returns. Any farmer who could establish pine plantation on an eighth of the farm could in any case achieve carbon neutrality and no liability.

The point is that pines are a 30-year crop, and CH_4 can be considered a 30-year problem. After one or two cycles, when global emissions from consumption of fossil fuel ends, our descendants will no longer need to care about CH_4, and the M-ETS could be discontinued. The world will need to keep reducing atmospheric CO_2, and eliminating other GHG, but stable agricultural emissions of CH_4 and even N_2O will not be a concern for humanity.

The METS would serve production forestry, agriculture, and our NDC

Under the Paris agreement, and subsequent reduction of our NDC, we have targets for total GHG emissions. Within that, NZ is free to manage CH_4 separately from the other GHGs as long as the total net emissions match our targets. For this purpose, afforestation with fast-growing exotic forest at a very large scale is desirable, and it might mean that the country's agricultural products could be marketed as carbon-neutral. Any exotic forest should come with the clear understanding that it is a crop, no less than lucerne or swedes. It differs in having a 30-year harvest cycle, and greater time and cost for clearing and restoring to pasture, but no greater expectation that will not occur.

A M-ETS unit price managed for the benefit of both production forestry and agriculture would allow the PFC ETS to reach whatever level international markets determine. That would provide real disincentive to burning fossil fuels and ensure that doing so paid enough for proper restoration of NZ native forests.

Subsequent to the above submission from 2022, I have read the discussion document about the PFC and the ETS reviews, and specifically considered the potential role of transition forests. I stand by my earlier arguments, and indeed I think that the best way to handle transition forests is by a combination of the present ETS and a M-ETS as defined above.

Specific responses to questions in the Permanent Forest Category (PFC) 2023 review.

Question 1: How do you think the Inquiry's recommendations could be reflected in proposals to redesign the permanent forest category?

The Inquiry into the effects of Cyclones Hale and Gabrielle highlighted that past decisions, especially in response to Cyclone Bola in 1988, had created new problems as bad as the original. Exotic afforestation in Tairāwhiti had been greatly expanded after Bola's effects showed that much of the highly erosion prone land should not be in pasture, but it is now obvious it should not be in *P. radiata* either. Radiata pine is an excellent tree, and the mainstay of New Zealand's fourth largest export industry, but preventing erosion in very susceptible land is not one of its strengths.

In fact the Inquiry does not suggest abandonment of production forestry with *P. radiata* throughout the region, as the problems were only from a few per cent of the planted area. Whether the suggested coupe harvesting is viable will be a question for the industry, and it may make production forestry less competitive as a land use, but I think that does not have large bearing on the questions here about the ETS and PFSC. I very strongly feel there should not be large forests of exotic species in New Zealand that are not planned for harvest.

We want the redesigned permanent forest category to achieve multiple outcomes

Question 2: Do you agree with our assessment criteria for the redesigned permanent forest category? If not, what would you change and why?

I support the assessment criteria, and I would suggest they apply also to production forestry as well as permanent forest, especially with regard to supporting local economies and their physical and financial resilience. I do have reservations about:

4. **Support Māori aspirations for their land**

    - Actively protect Māori interests and ability to make decisions regarding their land in line with their cultural, social, environmental, and economic aspirations, while considering that a high proportion of Māori land is marginal and difficult to access.

While I wholeheartedly endorse the interests and aspirations of Māori for their land, I worry that the ETS may have distorted those and created a false value. If the owners really want to see large tracts of exotic species colonise their land and permanently displace indigenous species that is their right, but I suggest it is a temporary perspective and out of character with either historic aspirations or those of future descendants. The attraction of fast-growing exotics to provide a large financial return on land that has no comparable alternative income potential is undeniable, and I do not question its importance to lifting the prospects of Māori landowners and their dependants. However the very high value of sequestered carbon is a product of industrialised societies' abuse of Earth's ecosystems. It is also temporary, in a view that encompasses centuries rather than just human lifetimes, generations, or mere terms of political office.

If the owners can take a long-term view of what they wish for their land, and if that would be native reforestation on remote or marginal land, I prefer that we taxpayers or carbon emitters fund that directly rather than incentivise 'permanent' exotic forest or even transition forest. The

reestablishment of native forest via the natural pattern of mānuka and other native shrubs to tree ferns and other forest understory is actually a much better plan.

Question 3: Do you think any of these criteria are more important than the others? If so, which criteria and why?

The priority for the PFC has to be long-term carbon sequestration, and better quantification of the rates of sequestration and their long-term trajectory with indigenous forest is very important. I think it is a mistake to require long-term storage and rapid short-term sequestration of the same land, and the best approach for rapid uptake of GHG is with production forestry. Plant pines or other exotics, cut them down after 30 to 70 years (according to species), and don't release the carbon to the atmosphere. Then 'rinse and repeat'.

Though I know there is widespread opposition to the conversion of 'good farming land' to pine forest, I do not share that concern. As long as it is understood that the exotics are a crop to be harvested in due course, I don't much mind where they go. As I expound in my opening essay, NZ has seen large areas of the central North Island go into several generations of pines and then return to pasture. It works well.

Design Choice 1: Which forests should be allowed into the permanent forest category?

Question 4: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? (Note, options 1.2a and 1.2b are not mutually exclusive)

I continue to think that only Option 1.1 should apply, and I am circumspect even about transition forests, though I appreciate that the 2022 review allowed them. As above, I think that transition via native 'scrub' and ferns back to indigenous forest is a better option than most exotics. With the latter, I wonder how many generations it takes before a transition forest really looks indigenous.

My concern with any alternatives under PFC is that I feel the carbon price for PFC should be high – at least \$150/tCO_{2e}, and this creates a very artificial environment if it is open to exotic species. As has been observed of our GHG profile, and its high proportion of CH_4 and N_2O, NZ is more like many developing economies than the OECD. We are also similar to the former in the prevalence of marginal land at plausible prices for carbon capture, and we have the benefit that our best species for production forestry grows several times faster than it does in its homeland. The one problem is that produces the same wrong incentives as in tropical countries that clear rainforest to plant palms. We might by helping to save humanity from the damage it has done to Earth's ecosytems, but the answer that is right for the world is wrong for NZ. We need a more nuanced system to deliver the benefits the world needs while making Aotearoa better on its own terms.

Question 5: If you support allowing exotic species under limited circumstances, how do you think your preferred 'limited circumstance' should be defined? (for example, if you support allowing long-lived exotics to register, how do you think we should define 'long-lived'?)

My solution would be that all exotics would fall under a system for off-setting methane, rather than long-lived GHGs. The price would be much less, and the incentive consequently less perverse, but it would still be substantial. A big difference is that it would be affordable for forest harvest.

Permanent forests could support environmental benefits and climate change adaptation and resilience (afforesting erosion- prone land)

Question 6: Do you think there is an opportunity to use permanent forests to stabilise erosion-prone land?

Yes certainly, and you can see this regularly across the King Country, where pockets of steeper land remain in podocarp forest on existing farms. Much more needs to be done on pest control, and on establishing larger contiguous blocks as native wildlife habitats, but the erosion control is already visible.

Radiata pine does a poor job of stabilising highly erodible land, or indeed withstanding serious wind-storms. Other exotics can do much better, and in small patches on farm they may be the easiest option. As above, I would credit these only with my short-term M-ETS, not with the PFC.

Permanent forests could help address the risk of wilding pines

Question 7: Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?

Yes, if exotics are endorsed at all. As I would restrict the PFC to native species, they are free to spread wherever they like from my perspective.

Design Choice 2: How should transition forests be managed to ensure they transition and reduce the financial risks to participants?

Question 8: Do you agree with the proposal for a specific carbon accounting method for transition forests? If you disagree could you please provide the reasons why?

In line with my proposal for a separate M-ETS for exotic species, with a limited term focus, the obvious step would be to allow exotic species to offset methane, admittedly at the much lower suggested rate, but then a transition forest would become eligible for PFC credit as the indigenous species established. In this respect, the criterion would simply be what proportion of the forest was exotic and what was indigenous. Then the transition to indigenous would simply be an alternative, or perhaps just subsequent, to obligatory harvest of exotics.

Question 9: If you agree with the proposal for a specific carbon accounting method for transition forests, what do you think it needs to achieve?

As in Question 8, and expanded earlier, my version would see separate M-ETS credits for exotic and indigenous species, so transition forests would shift over time from the M-ETS to PFC.

Question 10: What do you think should occur if a forest does not transition from a predominately exotic to indigenous forest within 50 years?

Again, my proposal is that any exotic plantation would only be eligible for short-term M-ETS credits, and there would be an expectation of harvest. As the M-ETS price would be maintained at a low level (e.g., \$20-\$25/tCO_{2e}), the liability for buy-out of sequestered carbon would be moderate, and generally commensurate with harvest returns. A significant difficulty with allowing exotic forest under PFC is that the carbon prices necessary to disincentivise fossil fuel use then make carbon forest far too expensive. The net return from harvest would not come near the value of the sequestered carbon, even though a significant part of that carbon will be released if the forest simply senesces. The real benefit of carbon sequestration in fast-growing exotics comes from harvest and then use of the timber in durable products.

Design Choice 3: How should permanent forests be managed?

Question 11: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? (Note, options 3.2 and 3.3 are not mutually exclusive)

My view is that both options 3.2 and 3.3 will be needed. All forest classes, whether for carbon sequestration or production, need protection from fire and from disease.

I think that the risk of fire is much lower for indigenous forest. It may increase in a changing climate, but generally the range of crown heights, the understory of ferns and shrubs, and the more humid surface environment in natural NZ forest does not carry fires the way that uniform plantations do.

On the other hand, indigenous forest also carries the expectation of being a supportive environment for native species of birds, bats, reptiles, and invertebrates, and for that it needs an active programme of predator management. The understory is an important component of ecosystem health, fire resistance, and filtration of precipitation, so it has to be protected from grazing by feral and farmed animals. Such predator and pest control is expensive, and that is a further justification for a high carbon price for the indigenous forests to which I would see the PFC restricted.

Question 12: If there were to be additional management requirements for transition forests, what do you think they should be for? Why?

I think there would not need to be much in the way of additional management requirements for transition forests if there were a separate M-ETS for exotic forest. Transition forests would just progress from one system to the other as tree species changed.

Question 13: Do you think transition forests should be required to meet specific timebound milestones to demonstrate they are on a pathway to successful transition?

As I envisage it, the transition from exotic to indigenous species would shift the forest from low carbon prices (e.g., \$20-\$25/tCO_{2e}) to high prices (\$150-\$200/tCO_{2e}) as the balance of species changes. I expect that would be incentive enough to make the transition. Because of the much lower price attributed to the carbon in exotic species, there would be much less disincentive to harvest. The relative value of conversion to indigenous, at higher cost but with the attraction of high carbon prices, might be better than for reversion to farm land. Either way, the forest owner could make that decision on economic grounds.

The whole point of the ETS is to provide financial incentive to do the right thing by Earth's environment. It is better where possible to simply allow it to do so, even allowing that our past attempts to do so keep throwing up new complications and some unwanted incentives.

Question 14: Do you agree with this proposal to allow transition forests to be permitted to clear-fell small coupes or strips to establish indigenous species? Why? And if you agree, what other restrictions should there be?

I don't have experience of this scenario to comment - the forestry industry needs to address this question. In doing so, it should be accorded the attention and respect due to our fourth largest export industry. By MPI's own figures in the 2022 PFC discussion document, production forestry is, on average per hectare, twice as productive of GDP and employment as sheep and beef farming. Both have some unwanted environmental and societal impacts, but many of those are complementary, and both industries are needed to pay the bills, including for climate change response.

Design Choice 3b: How flexible or prescriptive should forest management requirements be?

Question 15: If forest management requirements are implemented, do you think these should be prescriptive or outcomes focussed? Why/Why not?

For many such contexts, the most widely accepted model has straightforward prescriptions for minor parties, such as farmers or other investors with a small area of affected plantation. Much larger operations may find value in a system based on outcomes, allowing them to develop a plan that delivers more than the prescription at lesser cost.

One way to implement forest management requirements could be via forest management plans

Question 16: What are your views on forest management plans?

I think that forest management plans will be needed for PFC forests. Because I think that exotic forest should only be eligible for the M-ETS that I describe above, consideration of that could be contained in the NES-PF. If there are transition forests, they would need to develop a PFC management plan at some stage of the transition.

Question 17: What should forest management plans include?

Key features are control of feral deer, goats, and pigs for the health of the forest understory, and control of possums, rodents, and mustelids for the health of birds and other native fauna. Disease and fire are further risks, and there will be a need to monitor carbon sequestration rate if NZUs are priced as highly as they should be.

Question 18: Who do you think should be allowed to verify forest management plans?

Whoever can do it most cost-effectively. Despite the need for such a system, it should not be allowed to become a large burden on permanent-forest managers. This is especially true of PFC plantations of small size, such as on erodible gullies on farms or within a larger production forest.

Question 19: How often do you think forest management plans should be audited or re-verified?

Initially it should probably be at every Mandatory Emissions Return Period, but for long-established PFC blocks that have passed all previous reports it could probably become less frequent.

Question 20: What do you think should happen if there are not enough people to verify forest management plans?

I think it is likely that methods of aerial mapping by helicopter or drone will make much of the monitoring faster and easier. I would hope that it does not require too many people scrutinising paperwork. With luck, this question will not arise.

Design choice 3c: What should the compliance (monitoring and enforcement) regime look like?

Question 21: Do you think the use of existing compliance tools are appropriate?

Yes, some enforcement will be necessary.

Question 22: Do you think there should be new or expanded compliance tools for permanent forests? Which ones and why?

The purpose of the ETS, and of my suggested M-ETS for exotic forest, is to put a value on sequestration of carbon as a public good, and so to reward those whose activity fosters it. The obvious corollary is that enforcement becomes a matter of contract compliance, and forest managers miss out on credits if they can't demonstrate they have earned them. Failure to comply with other legislation, such as relating to pests, predators, or disease control, would be a matter for the compliancy measures of that legislation.

Question 23: Are there other compliance options that you think we should consider?

One important consideration is the difference between administrative default and actions or situations that undermine or diminish past action. It is well to remember that forest owners accumulate credits as they sequester carbon, and there is a big difference between failing to sequester more and anything that results in release of past sequestration. The former should only result in reduced earnings, whereas the latter requires surrender of past credits.

Question 24: For the compliance tools you think we should have, when do you think they should be used?

Again in keeping with the whole concept of the ETS, compliance tools need to focus on maintaining and enhancing sequestration of carbon. The distinction can be made between failure to increase carbon storage, so that further credits are not earned, and failure to manage pests, disease, and fire risk so that stored carbon is lost.

Submission on the discussion document
Review of the New Zealand Emissions Trading Scheme

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23rd August 2023
[redacted]

Introductory Comments

Thank you for the opportunity to submit on the discussion document: Review of the New Zealand Emissions Trading Scheme (ETS review).

We acknowledges the statement in the ETS Review page 4

> *We want to hear your thoughts on both issues – and will try to incorporate all your feedback on both topics, regardless of how you provide us feedback. However, when you are providing us feedback, please try to target your feedback to the relevant consultation feedback questionnaire.*

We agree that both the ETS Review and the discussion document on proposals to redesign the permanent forest category in the NZ-ETS (Permanent forest) issues are intricately intertwined and as such we have elements of both outlined in our submission. However structurally we have only addressed the Questions relating to the ETS Review in this document.

If appropriate, I wish to be heard in support of its submission.

About the Submitter

This is a personal submission via my consulting company G F 2019 Limited.

Although components of this submission contain elements that were part of the NZIF submission(which I contributed to) it also adds several comments that are from ourselves and perhaps more pertinent to private land owners vs commercial forests.

Prior to 2020 I set up Woodnet 2005 Ltd that morphed into the land use and plantation management component of what is now Forest 360 Ltd.

Between then and 2009 we were instrumental in submitting and managing what was then 10 % of the countries ETS registration by number.

In that time, we came across just about everything there was involved in the scheme and feel qualified to comment within this submission accordingly.

I am also involved with Orme & Associates however this submission is independent ot the one they have submitted.

Submission Summary and Recommendations

We are deeply concerned that;

- Driving motivations for the proposals are as much related to political short-termism as they are to actual fact or need.
- The lack of sufficient modelling or transparency in data to properly evaluate and respond to issues that have enormous ramifications across a range of parties in NZ is in our view unacceptable. Similarly, the insufficiency of time to reconstruct our own modelling or workshop with policy makers' risks poor policy outcomes.

- The mechanisms and objectives behind afforestation have lost clarity and become conflated with hysteria over farm conversions and other political agendas. NZ needs to clarify forestry objectives mechanisms as those required to stabilize NZ's productive plantation forest sink to support an export and processing bio-circular economy and those required to expand our permanent sink to offset future difficult to remove emissions as well as compensate for our slow historic progress.
- Changes to the market regime should not be considered until changes to the permanent forest ETS eligibility frameworks are decided and implemented and clarity of future trajectories achieved. We suggest that limitations discussed in the permanent forest redesign section may sufficiently restrict new permanent afforestation.
- Stability in the current ETS market needs to be re-established by confirming that future ETS changes will not be retrospective and existing participants **will be 'grand-parented'**.
- If there is to be future changes to the market structure in respect of forestry, such controls will be upon projects and area made available for entry to the ETS scheme – not artificial price control or market monopolization (single government buyer).
- MPI/MFE had not, should have and now need to form a specialist competent consultative working group to assist them in refining and understanding details that will make policy and regulatory frameworks operationally sound.
- A NZU in the ETS market should be treated equally and not have any distortions or value of one NZU relative to another.

Submission

Background

We are deeply concerned about the apparent lack of good data upon which to judge the veracity of the proposals. However, we believe there are fundamental issues to be partitioned to gain clarity on what the objectives of forestry's contributions to NZ's efforts to achieve Net Zero by 2050 actually are.

Principals underlying our response.

In our view there are two concurrent but not necessarily parallel objectives – in aggregate they serve to meet NZ commitment to the Paris agreement and assist in NZ 's journey to net zero by 2050 and beyond.

Separately they are;

1. Stabilize NZ's current forest carbon sink so that it can provide a solid base of sequestered carbon that is not oscillating between being a source of removals and a source of emissions. This is a first step in meeting the county's obligations.
2. The second is to provide for added removals over and above that of the stable sink to absorb carbon or carbon equivalents where the country as a whole has failed and or can't do so.

With those objectives in mind the question then becomes how best to do it?

- With what forestry models
- And with what forms of encouragement.

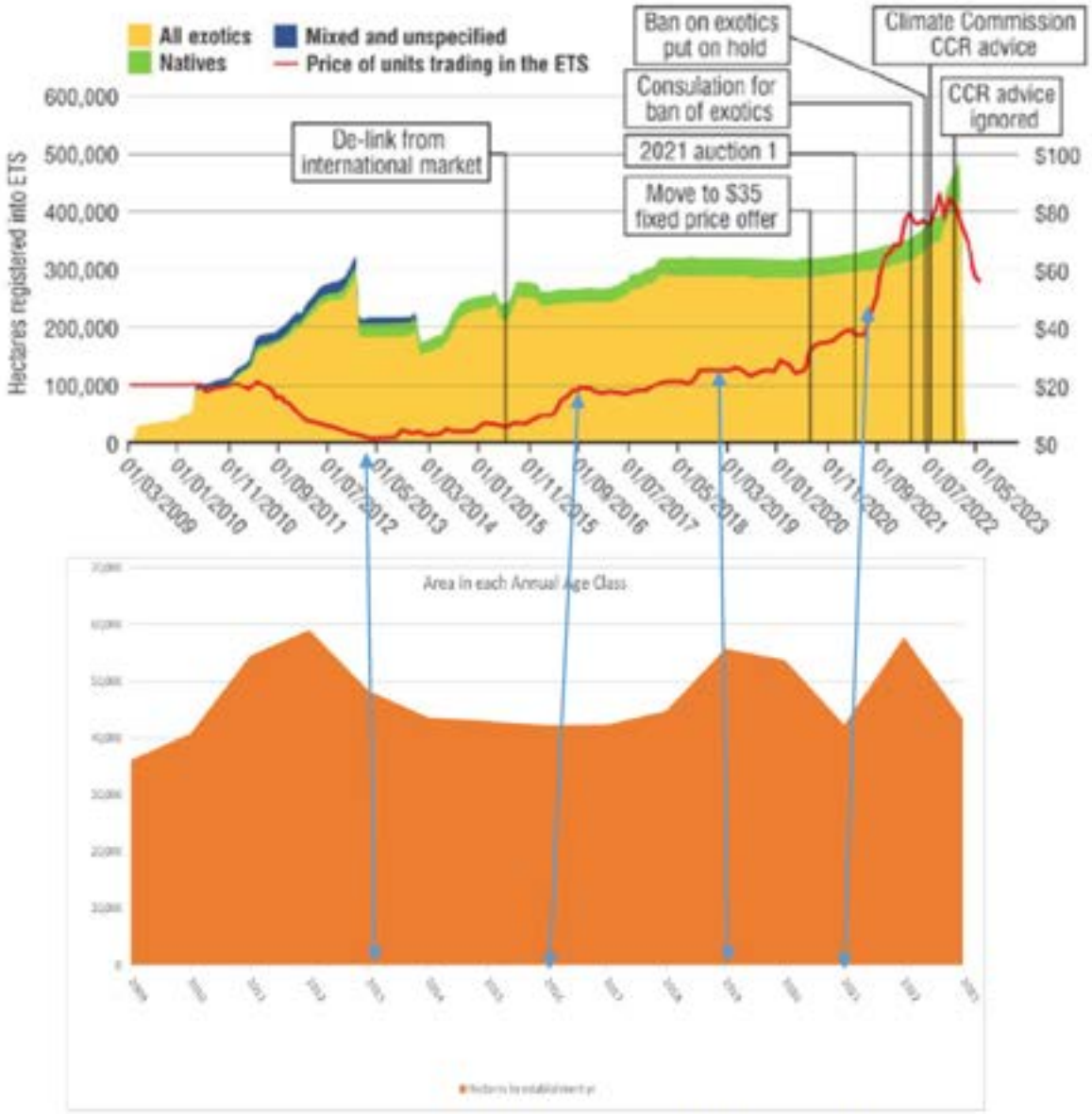
NZ's Plantation forest sink.

The plantation forest estate in NZ has been subject to waves of afforestation and deforestation over its history of development. The causes have been strategic, political and economic including from economic distortion arising from policy settings. In the recent past, fears about the encumbrance created by the ETS, undermining of the ETS (hot-air units) and rampant (predominantly) dairy expansion without constraints upon nitrate leaching, water quality, carbon and carbon equivalent emissions and cheap access to water all contributed to significant levels of deforestation in the NZ plantation forest estate. This has only started to reverse in recent times.

The national exotic forest description as at Apr 2022 indicates that the estate size in 2019 was 1,697,000ha[1], some 130,000ha smaller than it was in 2003 which represented the maximal scale of the estate after which planting rates did not keep up with the rate of harvesting and deforestation to pastoral agriculture. Fig 1 illustrates the price path for NZU's in relation to the repeat and regular policy interventions and adjustments along with the trends in registration onto the ETS. This is compared with the annual area in each age class of the current exotic estate over the same period which is a combination of replanted areas after harvesting and new planting.

[1] NEFD

Fig 1[2]



The approximate alignment of dates suggests that for those involved in the productive plantation estate and allowing for lag times involving seed orders and nursery production, there was plenty of incentive to deforest while prices were low and not much incentive to afforest until the NZU price rose above $25 an NZU. Figures are not available for 2023 though new planting (not including replanting) for 2022 is listed as 45,000ha and the total productive plantation forest estate is listed at 1.757 million ha, still 70,000ha short of its previous maximum.

[2] ***Timeline of hectares registered into the ETS and NZU prices.*** *Courtesy Otago Daily Times 2nd June 2023*

Why the sink matters.

A reduction in the size of the estate is one problem – net emissions will be higher into the future than they might otherwise have been. In NZ this has been caused by a variety of factors relating to policy settings directly and indirectly affecting relative economic competitiveness of competing land uses (pastoral and forestry), international market signals and capital flows.

An uneven age class distribution within the existing estate becomes a potentially significant problem because while a growing forest sequesters carbon, it becomes an emitter at time of harvest.

In NZ market signals in the early 1990's led to a large increase in planting over part of that decade followed by a period of low levels of planting (economic signals) and then significant deforestation into pastoral agriculture to get ahead of the restrictions of the impending ETS that would impose penalties upon forest owners who cleared forests.

The result today is a significantly imbalanced age-class distribution that if harvested more or less according to the ages of available stands, will continue to cycle through periods of significant CO_2 removals and emissions that will have to be reported as part of our international climate change obligations. Such imbalances also do little to assist long-term domestic industrial processing.

Figure 2

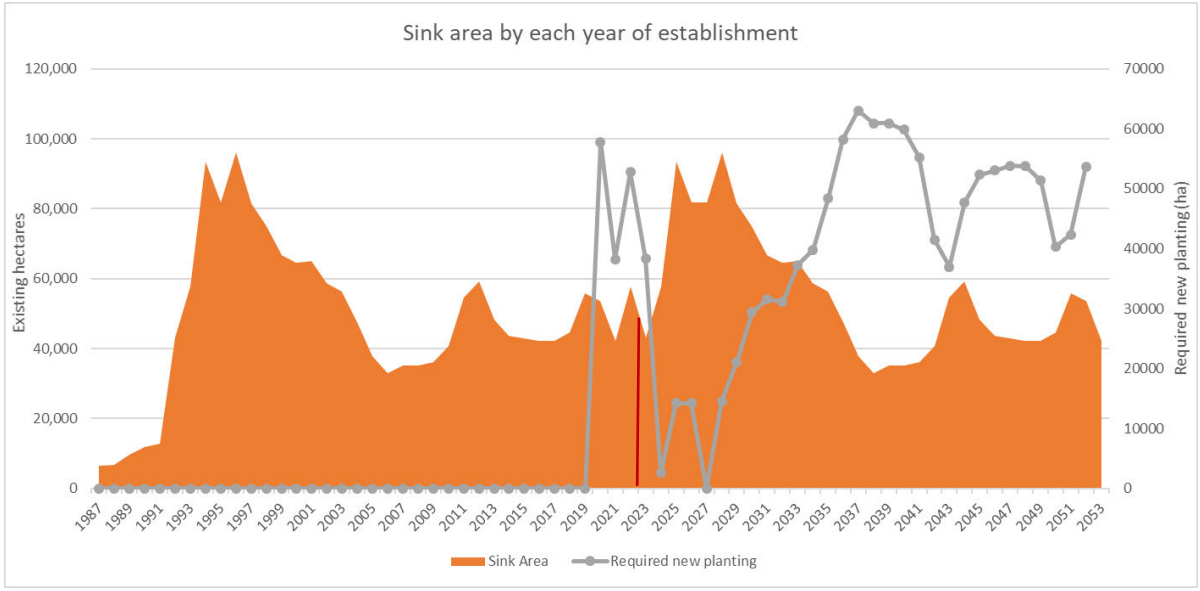


Figure 2 illustrates the concept (without moderation for the individual harvesting and replanting decisions being made now and in the future) and demonstrates both the potential repeating nature of the

problem and the annual levels of replanting and new afforestation (catch-up area) that would be required to stabilize this particular sink profile.

Stabilizing the sink.

Based on simple calculation of the difference required to stabilize the unmoderated plantation forest sink over the periods ahead suggests new afforestation, over and above restocking, required between now and 2050 is 1.3 million ha. MPI projections are for 0.97 and 1.44 million ha.

Table 1

Year from (inc 2022)	**Average planting rate (ha/yr)**	**Accumulated added sink (ha)**	**Approx added annual CO_2 removals under averaging (t/yr)[3]**	**Total Plantation Forest estate 2050 sink**
2030	21,900	175,000	0.6562 Mt	3.05 million ha
2050	41,900	1,299,000	12.570 Mt	915Mt CO_2

Key considerations arising.

- Stabilizing the current plantation forest sink is a priority. If there is no stabilized forest sink, NZ emissions will be in a constant state of flux. Given the quantities of sequestration involved, stability at some level is important. That stability could be achieved above or below the theoretical level shown above, but if below, NZ will have to accept more aggressive gross emissions reductions, or more permanent forest removal planting (with urgency) or removals from abroad.
- Actual harvesting and subsequent restocking will be driven by market sentiment so peaks will likely be spread out. However, in the near term, NZ will reach peak harvest and without further urgent afforestation, the sink will decline and remain a net emitter for a considerable period into the future.

Table 2

Year	*2019*	*2020*	*2021*
NEFD afforestation	*19,000*	*34,000*	*45,000*
Projected requirement	*40,297*	*42,359*	*53,736*
Shortfall	*21,297*	*8,359*	*8,736*

- Afforestation undertaken under averaging and as part of an intensively managed production forest estate;
    - Hedges risks associated with fire, biosecurity and permanence of the sequestered carbon.

[3] Based on 16yr CNI carbon tables under averaging rules.

    - Cements in improved certainty for long term domestic and export oriented processing and circular bio-economic objectives.
    - Indicates higher economic and employment activity in the national and regional economies than the land use it replaces.
- But, in the future world, recognizing the expected impacts from increasingly severe adverse climatic events, afforestation for production forests with carbon co-benefits;
    - Will have to be on farmland and other previously cleared land devoid of significant components of indigenous vegetation.
    - Will have to avoid steeplands and highly erodible landforms. (This can be managed by a properly applied NES – PF rules)
    - Should be undertaken within an informed strategic framework that identifies broad goals required to achieve critical scales for effective processing outcomes. The Industry Transformation Plan and urgent research needs to complete the detail required to inform this outcome.
- Shortfalls in more or less 'filling the sink' could be compensated by forests dedicated to carbon and other biodiversity values only. With some caveats, this would be a less favoured route (see commentary on the revisions to the forestry rules) as the preference is that permanent forests should be being used to offset our future emissions often using less productive land.
- Responding to the challenge highlighted by the climate change exacerbated storm events on the east coast of the north island is going to lead to a requirement to retire significant portions of both farmland and current forest estate in those regions.
    - For farmland, retirement and reversion or afforestation to native is recommended. It will take an extended period of time and should be targeted for the sequestrations of future hard to eliminate emissions offsets.

Within the existing forests there is a potentially significant problem in transitioning the retirement areas to a native forest cover.

- 'it is highly likely that there will be a reduction in sequestration compared to continuing the original species'..
- For those areas not as prone to the debris avalanching and gullying that typified the outcomes from cyclones Gabrielle and Hale, where some form of production forestry may be manageable, it is unclear what models will eventuate, how to transition to them and at what cost or benefit. All these remaining areas, whether registered in the ETS or not have potential to be emitters in transition or stable sinks. There has been little consideration of this aspect in the current discussion documents.

Permanent forests – Adding to the nations' removals capacity.

We see the key role of permanent forests (but prefer them to be called continuous canopy forests) as being additional to the urgency of stabilizing the forests sink. Nevertheless, it is clear that the reduction

pathway for gross emissions is going to be slow and difficult, particularly if progress in relation to on-farm emissions is slow. Permanent forests provide an important mechanism that in addition to adding to the nation's removals capacity could also provide pathways to:

- Substantially improve landscape resilience in erodible landscapes.
- Improve and assist biodiversity recovery- particularly in lowland areas
- Diversify productive forestry species and management models.
- Be achieved in many cases with little loss in gross economic productivity from existing non-forest land banks.
- Provide alternative employment at regional and sub-regional scales.

Operation of the ETS

GF 2019 Ltd supports the need to focus on gross emissions reductions in the long term. As set out in the prior section afforestation needs to be used to stabilize our forest sinks and where beneficially able, to go some way, particularly in the short to medium term to ease the path as emissions reductions occur from non-forest sectors and in the longer term to offset difficult to abate emissions.

On the basis of the information set out above we do not believe there is any reason for reactive introduction of controls on the basis of concerns about area or annual planting levels.

On the issue of the flow of forestry based NZU's and the impact that may have on the ETS, ewe are of the view that current modelling showing a surplus of units early next decade does not account for the large proportion of the current total of NZUs that are held and will remain held in registry accounts to offset harvesting liabilities.

ETS redesign.

Consultation questions

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

We, like many others have concerns about the modelling and assumptions behind them and extends the concern to the fact that feedback is being sought on projections upon which further modelling is to be done before further consultation on preferred options is to be undertaken. On the basis of figure 3 projected forestry allocations and surrenders to the ETS the graph seems to show that once future NZUs surrender obligations are discounted and at an annual new planting rate of 38000ha, the tradeable NZU quantum is little more than the 20Mt of which around 12Mt simply stabilizes the production estate.

The remaining graphs appear based on assumptions about the market price response to supply of NZUs but it is unclear as to the assumption behind the magnitude and purpose of the new plantings – are they all permanent carbon forests only? Is price of NZU's the only dynamic constraint upon the area planted?

In short we are unconvinced that there is sufficient data and modelling to verify the concerns of oversupply being expressed at this point and justify such major intervention proposals.

We are aware of a report by PWC in its review of Govt modelling which concluded;

1. there is a *"significant level of uncertainty regarding whether the supply of NZUs from forestry will exceed NZU demand"*
2. they were critical of the source used to model supply noting that *"the mathematical model, which is used to derive the afforestation forecasts, is being used in a context where it cannot be expected to perform best. It is unclear whether*

it will derive a reasonable forecast of afforestation with NZU price inputs of around $100".

3. they note that the afforestation predicted by the mathematical model is *"much higher than historical levels. There is a question as to whether that amount of planting is achievable in practice, and whether there are practical constraints which would effectively preclude that result"*

2.2 **Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?**

We don't have specific information other than to note that some significant fossil fuel emitters had already embarked upon and were traveling down pathways for significant emissions reductions based on the foreseen price of NZU's and the added accountability pressures arising from emissions reporting. Some of those actions included investigations into long term conversion to and use of biofuels. Recent government interventions to invest in emissions reduction directly (NZ Steel) and requests to extend such investment (Fonterra) raise big questions as to the future efficacy of the market with or without changes to the ETS structure or NZU pricing. Big emitters have been sent a signal - delay and you will be rewarded!

2.3 **Do you have any evidence you can share about land owner and forest investment behaviours in response to NZU prices?**

The evidence is very clear – parties initially involved in afforestation were sensitive to price /value of NZU's. Figure 1 illustrates the sensitivity of planting to NZU prices and other interventions however the recent announcements in relation to the revision of ETS settings, the failure to follow the Climate Change Commission's Advice and announced future policy positions in respect of forestry by the major political parties have had an almost instant and likely substantial adverse response to forest investment. The current reversal of the Governments position in respect of the ETS auction floor and cost containment reserve may have partially restored some confidence, but any recovery is likely to be slow given the other factors also currently at play.

A research paper into the effectiveness of the ETS[4], noted that:

"Our findings indicate that the forestry sector, and the NZ ETS participants within it, have responded rationally to emissions pricing over time. However, multiple factors such as complex participation requirements, extended periods of policy uncertainty, and weak emissions price signals (particularly over 2011–2016) have likely restricted the effectiveness of the NZ ETS in changing forestry outcomes over much of its operating life"

AND

"However, the signalling of further changes to NZ ETS forestry policy in 2022 has created new uncertainty for market participants. Despite past challenges, the sector's (both full time forestry and partial within farm plantings) dramatic response to rising emissions prices in recent years demonstrates the NZ ETS is changing
landowner behaviour to produce net forestry removals".

2.4 **Do you agree with the summary of the impacts of exotic afforestation? Why/why not?**

[4] Including forestry in an emissions trading scheme; Lessons from NZ : Frontiers in Forests and Global Change: Carver T, Dawson P, O'Brien S, Kerr S, Leining C

The table reflects impacts that can or may occur as a result of forestry in some circumstances. One could equally state that replacing "forestry" with "pastoral agriculture" could furnish a comprehensive list of adverse impacts some of which are similar and others of which are unique to the sector, persistent, and collectively extremely damaging – including unabated emissions!

Offering no context or framework, the table will have done little other than fuel the partisan beliefs of those who don't want change within their back yard. Somewhat in the converse of the previous section, to the forest industry there might also be interpreted a signal – we say we want you, but actually we just want your capital at our disposal to be manipulated as seen fit to mitigate the emissions of 3rd parties within the political constraints of an agriculturally based culture!

3.1 **Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.**

G F 2019 Ltd believe the current ETS definitely has a role in driving gross emissions reductions. In our view, as has been stated repeatedly in the past, NZ must reduce gross emissions and we agree that we cannot plant our way out of the problem for many of the reasons proffered in the discussion documents. The primary question at the moment is not whether a properly structured cap and trade system inclusive of forestry can result in pricing sufficiently high to encourage reductions in gross emissions (which it seemed to be doing in recent times), but whether the prognosis for afforestation is, as portrayed in this consultation, so dramatic that excessive unit supply will flood the market taking away any incentive to reduce more expensive gross emissions and ultimately crashing the price of NZU's.

The ETS, in its original design, intended, with the inclusion of forestry, to provide the least cost method for meeting the country's obligations. The world and system dynamics have changed over the years and correctly, reductions in gross emissions is recognized as essential. However, any moves that also remove past or future CO_2 emissions from the atmosphere are also extremely important given the overly slow progress in reductions. Domestically NZ has failed and looks likely to fail to bring agriculture (50% of NZ's emissions) into some form of ETS umbrella, Government interventions have initially severely undermined the market (until overseas hot air was de-linked), free allocations have undermined the scale and breadth of the ETS and most recently the Government has directly intervened in subsidizing heavy polluters and opened the door to further pressure for direct subsidy which while possibly a justifiable means to accelerate emissions reductions, also reduces the demand for NZU's to be traded.

In our view at this stage we believe that expectations for afforestation in the future are unclear, overly optimistic and too early to call given the past and recent history of instability in the market. If there is to be a backstop to retain integrity in the ETS system then the focus should be on the control of land eligibility into the system rather that attempting to 'control' the value of the units. For forestry investors to participate they must have reasonable confidence that market conditions remain predictable (including, eventually, a decline in value IF NZ successfully reduces its gross emissions).

As a matter of national strategic risk management, the reduction of gross emissions according to the proposed trajectory is very uncertain and any shortfalls

will require annulling through carbon removal either domestically or at uncertain cost and credibility internationally. GF 2019 Ltd takes the view, particularly because of the compounding effects of accumulating emissions, that if the nation collectively is unable to meet its trajectory in reductions an overshoot in removals is a far preferable outcome that missing the net target altogether. Domestic investment in removals is also far preferable to sending vast sums of foreign exchange overseas to achieve the same end.

3.2 **Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?**

We accept that the value of NZU's will be set by the balance of supply and demand. This was always the case and includes the eventual inevitability of the price falling to low or zero values IF NZ is successful in reducing its emissions to near zero. Afforestation under the ETS is a one-off period of opportunity to drive strategically important changes in emissions, types, sources and landuse. It cannot be a permanent feature. The question at stake is one of timing and quantum in the balance between the supply and demand of NZU's.

In the view of the G F 2019 Ltd, the current round of proposed adjustment options seeks to try and manipulate price indirectly to facilitate perpetually increasing prices of NZU's to force changes in emissions reduction. Notwithstanding the fact irrespective of method, if emissions reductions are made, at whatever cost to the emitter and eventually emissions approximate zero, there will be no demand and the price of a unit will also approximate zero. To navigate that journey the trajectories will require constant manipulation and if that manipulation is going to discriminate the price of the forestry sink component at the whim of political will, then it is unlikely to attract much private capital interest. We would instead argue that the level and finesse of control being sought can only be achieved with the integration of private capital by controlling the eligibility of land quantum that can enter the ETS for sequestration purposes by way of allocation for projects of afforestation.

In summary – We neither agree nor disagree with the assessment, there has not been sufficient time nor data disclosure nor scenario or sensitivity analysis to make an assessment. We note however that;

- Efforts to indirectly manipulate price as proposed are unlikely to be very attractive to private capital.
- More directly influencing supply of ETS eligible projects into the supply chain is more likely to give the control and transparency policy makers are seeking while still underpinning the market foundation.
- Adjusting market supply parameters may not however serve other strategic goals such as stabilizing the forest carbon sink nor encouraging investment in native afforestation especially on highly erodible lands. Other mechanisms may still be required and to a large extent this may be determined by the means by which agricultural emissions are managed.
- We have no particular view as to the impact of increased NZU prices flowing through to costs for individuals and sectors of society. This is a given (however we are unsure of the 'actual costs and believe this has not been modelled effectively to date)as is the likelihood that segments of society, namely those less well off, will be disproportionately adversely impacted thus probably will require some compensatory policy initiatives.

3.3 **How important do you think it is that we maintain incentives for removals? Why?**

This is a matter of economics 101. Over the years the competing landuse of pastoral agriculture has faced very light handed regulation. Regulations as are now starting to come into play were vigorously and effectively opposed because they increased costs relative to revenue which ultimately flowed through to land value and the tax free capital gain that could be accrued over and above the basic farm income the participants paid themselves. On this basis, actual farm trading returns on capital employed were and often remain relatively low, but so long as externalities (N, P, sediment, E.coli and now gaseous emissions were cost free) farm land values could be continuously raised by pushing production. Forestry, by contrast takes little account of the capital gain in land as the benefits are highly discounted over the forest lifespan and investment is for trading return on capital expectations that are higher than many farms. The ETS provides a market for a new service (sequestered carbon) and that commodity creates a dramatic change in the economics for forestry and trees within farms as we have all seen.

While increasing NZU's has increased forestry profitability, this has clearly flowed through via farm sales for conversion to farm land prices and farmers themselves have benefited enormously. Such a trajectory is not open ended as increasing prices for NZU's feeding through to increasing land prices will in part limit the viability of forest expansion.

However, if incentives for afforestation are removed the likely trend will be back to the past status quo and afforestation will become low or zero in the face of poor farming returns never the less capitalizing value to land above the normal level of economic return actually earned by the enterprise. The converse would clearly happen if, in removing incentives for forestry, agricultural enterprise was brought into the ETS. Even at much reduced levels as proposed under Heh waka eke noa, land use change to forestry would again become very likely for much sheep and beef country.

NZ needs to decide whether it wants to reduce the financial liabilities to the nation by planting trees or maintain traditional rural lifestyles and pass the 50% of costs on to wider society. **Equally, there is a need for policy stability for any existing plantings so that land owners continue to plant where it is best done knowing that if policy changes in the future they will not be forced to pay the price(opportunity or added costs).**

The importance of maintaining sufficient incentive to maintain forest removals to stabilize the forest sink let alone offset some additional emissions quantum as well as offsetting the long term hard to mitigate emissions remains extremely important.

Consultation questions

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

We will defer to Māori entities / Iwi to consider this aspect of consultation.

4.2 What other interests do you think are important? What has been missed?

No comment

4.3 How should these interests be balanced against one another or prioritised, or both?

No comment

4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

We will defer to Māori entities / Iwi to consider this aspect of consultation

5.1 **Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?**

We agree that it is a priority that gross emissions be tackled and reduced. Whether the ETS is the most appropriate tool to achieve that objective in the light of the almost incessant vacillation over settings, charges, and direct emissions reduction subsidy investments is increasingly uncertain. It is a key tool available to Government and like other similar examples using tradable rights was intended to enable 'the market' to do the heavy lifting without need for regular political involvement. To date it has definitely assisted incentivisation of both reductions and removals all within the very recent past timeframe but its overall performance is more questionable over the time since implementation.

It is not clear how it will perform in the future with the options being promoted. It is very possible that for those involved in removals the situation will become too uncertain and their involvement will decline.
Should policy changes lessen the value of existing investment in tree planting, then the signal being sent to emitters is strongly dis-encouraging.
If entities look to invest further in gross emission reduction strategies (noting that THERE IS much work already happening in this space) then it will reduce confidence to invest in what are arguably more expensive gross emission reduction options in the near to medium future.

5.2 **Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?**

We see this as an important objective of the whole exercise but again note that if doing so, the rules around which any investment is made be set in place and protected by grand-fathering should things change in the future.

5.3 **Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?**

The enhancement of sinks (emissions removals) is a critically important mechanism;

- As a backstop to failure to achieve reductions in a timely fashion.
- As a mechanism to obtain breathing space while emissions reductions are introduced.
- As a means to leverage and stabilise existing forestry sinks that currently hold many years' worth of gross emissions.
- As a means to achieve other strategic goals from land use change, elevated domestic processing, bio-circular economy and biogenic emissions reductions.

- As a more appropriate way to meet emissions liabilities than purchasing overseas units at indeterminate and potentially very high prices.
- It can and is/was being implemented rapidly.

The ETS in very recent times has supported that objective. It is unclear whether it would continue to do so under the frameworks proposed. In such a circumstance policy would again need to be adjusted or new mechanisms introduced external to the ETS.

5.4 **Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.**

5.5 **Are there any additional criteria or considerations that should be taken into account?**

6.1 **Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?**

We believe that anything already in the ETS should <u>not be affected by any future policy changes</u> -That going forward there be no specific change just yet as assumptions and modelling have not been released and other moves – Labour (councils can decide where forests should go-) - National only 16000ha /year or unlimited in class 7 & 8 indicate that new planting rates are likely to plummet. We believe that a reassessment not least in terms of the forestry models eligible for entry into the ETS should be evaluated before then determining whether further restructuring of the ETS is required.

With completion of proper review and if a change is deemed necessary We believe none of the options are a good choice. Instead, controls should be on a project entry(as other countries have adopted but designed for NZ aspirations) to the ETS(over a certain area to allow for within forest farm plantings) basis after which the market is allowed to run freely. This system:

- gives more certainty to participants once they have entry.
- gives complete control to the Government's administrator as to the level of afforestation and subsequent sequestration as well as the types of forest models.
- Gives greater capacity to match climate change removals objectives with strategic "industry transition plans" objectives though the two may still not be in alignment.
- It most closely mimics the potential outcome effects of the proposed options 3 or 4 in that there becomes a much higher level of control of the scales of afforestation over time without interfering in the market values which will be critical to participants being willing to participate.
- Note however that we acknowledge this system will impose significant bureaucratic hurdles to participation that of itself will deter much enthusiasm for afforestation from certain sectors.

6.2 **Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.**

For both of options 3 & 4 we believe there is an assumption that new participants will remain eager to invest in the scheme. We believe this is incorrect - both these systems have considerable down side risk due to the restricted nature of the market and or the price, particularly if the price setter is solely the Government Regulator acting independently of the open market ETS price.
The Australian ERF, as one example and the closest neighbour to NZ, with its Carbon Abatement Contracts having the Commonwealth as the sole purchaser forced sellers / project proponents to one purchaser at the lowest price for the Commonwealth. Project owners and project proponents knew the market only existed because the government were the 95% plus buyer of all ACCUs and this supressed prices but more importantly limited the scale of abatement to the lowest cost abatement and did not stimulate investment in new abatement opportunities. A market, NZU market being no different, requires depth and breadth of supply and depth and breadth of engaged parties and it is difficult to understand how the government interacting as outlined in Options 2, 3 and 4 will stimulate the market such that depth and breadth is maintained or indeed enhanced.

6.3 **Of the four options proposed, which one do you prefer? Why?**

We prefer that it remain unaltered.
We also note that there are no barriers to a NZ ETS participant selling NZU offshore to a willing buyer.
The current EPA exchange and system can support this as it did when NZU were considered Kyoto units and sold internationally.
The same unit transfer systems exist now as were in play when NZU could be sold as a Kyoto unit and at the time this was a seamless process.

6.4 **Are there any additional options that you believe the review should consider? Why?**

See 6.1

6.5 **Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?**

6.6 **Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?**

7.1 **Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not ?**

We believe the exiting approach can be added to. The suggestion of change has already had a significant negative impact on participant confidence in the Crown being capable of making good decisions. We believe that ETS admission of future plantings can be controlled better through the forestry models that might be approved projects for entry to the ETS and by the additional value that might be earned through a biodiversity credit system. On their own, NZU prices will still be slow to attract

the investment into large scale indigenous afforestation. However, with additionality of biodiversity credits – if introduced is may become more attractive and feasible. However, We believe the two systems should preferably remain independent to maintain clarity and transparency in the market without which investment in the scales required may not eventuate.

7.2

If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

The current system with enhancements to recognise biodiversity credits – once again we re-iterate that we consider any options that has the government as a buyer, or indeed the sole buyer, of NZUs as very low value options at best.

7.3

Should a wider range of removals be included in the NZ ETS? Why/Why not?

Detailed cost-benefit analysis of the example options needs to be completed before support (or otherwise) can be given.
Given that prior reform has had a primary objective of simplifying the ETS, any other removal types should only be considered if they can encourage meaningful quantum of additional removals, that the removals can't easily be reversed and are simple to measure.

7.4

What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

The 1BT scheme was incredibly successful in encouraging landowners to do within farm planting. Re introduction for this as it was (so that other exotics can be encouraged to be planted as well as indigenous species) will go a long way to positively affecting land use change, emission reductions from agriculture and active sequestration.

Also Stock emission reductions should be allocated to forest planting as opposed to the farming sector s we currently understand is done – this is to fully recognise the benefit of planting trees as opposed to hiding actual agricultural emissions. By all means recognise the reduction but please recognise that it is forest planting that has created the reduction in the first place.

Conclusions.

General.

In considering the discussion documents covering both the proposed changes to the ETS and the changes to afforestation models eligible for entry into the ETS, we:

1. Register our deep concern that the consultation initiative has been pre-emptive of the final Climate Change Commission's recommendations, is limited in the transparency of the assumptions used to model and justify the proposed changes and lacks sensitivity and scenario iterations to better inform the discussion over what are proposed changes with very significant implications to the forestry sector.
2. The proposals come out at a time where some of the underlying justifying assumptions appear at odds with the current reality and are likely to be even more divergent post-election.
3. We believe that in the first instance, changes to the role of forestry in the ETS should be focused on the forestry models that are eligible, and once defined and operable, only then should further adjustments to the ETS be considered IF required and after further direct and detailed consultation with the sector which is the party most directly impacted.
4. We believe that before any final decisions are made, MPI and MFE need to establish a working group of knowledgeable and actively engaged sector specialists to refine and clarify the details surrounding any proposals. The lack of good faith consultation with the sector that is and will be most significantly affected has been unwelcome.

ETS changes.

1. We have been deeply concerned about the evidential base used to justify the proposed changes. The projections of new planting for permanent carbon forests seem uncertain even prior to the collapse of the NZU price and now seem highly likely to be significantly overestimated.
2. From national forest description data, We believe NZ needs large areas of new planting of production forests under ETS averaging just to mitigate the emissions oscillations from the current plantation forest sink – the recent NZU crash and recently announced policy positions by political parties suggest the required targets will be seriously hindered before even considering any additional afforestation for formation of additional long term sinks.
3. G F 2019 Ltd contend that more clarity and verification of modelling is required to make real assessments about whether the ETS and afforestation will consume all efforts to reduce gross emissions and that significant oversupply will crash the market in a short timeframe. This is particularly the case in the light of proposed forestry eligibility changes and restrictions.
4. The current assumptions and modelling in respect of total NZU supply from forestry and other sources and demand from emitters seems deficient in separating sources of supply from new (and recent past) averaged production plantations and new (and recent past) permanent forests and sensitivity forecasts re future planting from those sources. There also appears to be a disconnect between national objectives in respect of stabilizing the production forestry sink, adding new removals capacity and consideration of the impacts of policy affecting large areas of forestry the subject of the government enquiry into land use post cyclone Gabrielle and Hale.
5. NZIF recommend that **consideration to changes** to ETS market structure should be deferred until permanent forestry redesign policy is completed and implemented and at the very least

clear undertakings be given that should future changes be required, current participants will be grand-parented.

6. If at some future date changes to the ETS market are required changes should focus on restricting quantum (area) entered into the ETS rather than the market mechanism itself.
7. A potential for a future mismatch between supply (oversupply) and demand might be conceivable particularly if demand is deflated by subsidized emitter interventions and failure to bring agricultural emissions into the system. It is also conceivable under certain conditions, that such a mismatch might occur in the market while targeted levels of planting to either or both stabilize the forest sinks or re-afforest eroding but low productivity hill country are not met. This would not represent a failure in the ETS but rather recognize its limitations and that other mechanisms may still be needed in the future to meet climate mitigation and other national objectives.

General Comments

G F 2019 Ltd would like to thank you for the opportunity to submit on this consultation. We would welcome any opportunity to provide further clarification in relation to the points we have made in the body of this submission.

If you have any queries, please contact the undersigned.

Yours sincerely,

Stuart Orme
(RMNZIF)
Registered Forest Consultant
G F (2019) Limited
[redacted]
[redacted]

[redacted]

Submission: Te Arotake Mahere Hokohoko Tukunga - Review of the New Zealand Emissions Trading Scheme

About the Submitter

[redacted] provides experience and specialist expertise across all aspects of commercial forestry. We can help to establish, manage and harvest your forest to achieve the best returns possible. Formed in 1990, [redacted] has continued to provide forest owners with industry-leading expertise in the establishment, tending, harvesting, and marketing in Canterbury, the West Coast, and Otago/Southland. With experience, scale, and direct access to markets – both export and domestic – we ensure you get the best result from your forest investment.

Our client list makes for a formidable line-up that spans the length of the country and includes both big and small companies, as well as public and private interests. Key contracts have included NZ Super Fund, Rayonier, Forest Enterprises, Gibbons Holdings, Ngāti Tama, Ngāti Rārua and Tahuhu Forestry, CNBM and multiple regional and district councils.

We highly value the technical proficiency of our team. With years of experience in all aspects of forestry, we provide up-to-date knowledge combined with many years of sector experience, to ensure you receive the most cost-effective and results-focused service. In today's complex world we provide clear solutions to ensure you achieve your goals while complying with all regulatory requirements.

In all our work our focus is as much about growing relationships as it is growing forests. We take great pride in the reputation we have earned since 1990. We do everything in our power to ensure this reputation continues to grow as we do.

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

The assessments used in this consultation document are based on survey data from November-December 2021. At this time the ETS and the price of carbon was relatively stable, although slowly increasing, and working to market conditions. However, since this time, there has been serious undermining of the ETS through various potential Government policy change announcements, international pressures through the war in Ukraine, the new redesigning of the carbon accounting categories (averaging and permanent forest categories), etc. This has created a lot of uncertainty around the ETS, the value of carbon credits in the short to medium term and uncertainty in investing in the ETS.

Due to this uncertainty, which may continue in the foreseeable future, the assessment of reductions and removals used in this discussion document does not fairly represent the current market conditions and is not a reliable source of information to use for assessing how the NZ ETS will drive reductions and removals in the short, medium and long term. The presentation on Modeling for the Review of the ETS noted that modeling ETS supply and demand was very uncertain and complicated. As such using this data to form permanent policy change is not ideal.

2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

No.

[redacted]

[redacted]

2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

orest investment in new afforestation (both through the purchase of suitable land and the planting of new forest areas) has decreased over the last year or so due largely to the uncertainty around proposed Government changes that have been indicated at regular intervals over the last 12-18 months These include changes to the permanent category (particularly around exotic vs radiata pine only and then no change in the short term), proposed redesign changes to the ETS, climate change recommendations not being adopted, confusion around the form He Waka Eke Noa will take, etc. It is largely this uncertainty about government direction and possible changes in policy and regulations that has driven away investment into forestry – not the price of NZU's.

2.4 Do you agree with the summary of the impacts of exotic afforestation? Why /why not?

No.

Land-use flexibility - It is a legal requirement under the NES Freshwater that only 10ha of plantation forest can be converted to pasture (reg 16(3) and (4)). Therefore, the reduction in flexibility of land use is not driven by the use of the land as plantation forest, but by the Government requirement that plantation forest can not be converted back to pasture on scale.

Permanence - Carbon is stored in all vegetation. All primary crops are therefore vulnerable to fire, wind, storms droughts, pests and pathogens. Forests have a greater fuel loading in terms of fire, but a larger area of New Zealand is covered by pasture, scrub and non-forest vegetation and this would release proportionally more carbon into the atmosphere if lost particularly through fire and erosion. According to Te Uru Rākau quarterly statistics (as at 22 December 2022), of New Zealand's 10.1 million ha of forest, only 2.1 milion ha is deemed to be forest land in terms of the ETS definition (both pre 1990 and post 1989 land). Of this only 0.7 million ha is eligible to be entered into the ETS and of this only 0.54 million ha has actually been entered. Therefore, a vast percentage of non ETS forest in New Zealand is more vulnerable to destruction due to climate change than that in the ETS. Recognition of the other sources of carbon loss and how to replace that has to be considered without relying on ETS settings to counteract climate change.

Land-use change – we are in agreement with the comments made under this challenge of forestry providing a return to land-owners for otherwise unproductive land and the ability for forestry to assist in the preservation of erodible land (through conservation plantings as well as space planting to also provide improved animal welfare). However, while unmanaged forests may provide fewer export opportunities, the Forestry Industry Transformation Plan (ITP) has set out objectives to reduce exports and process more wood products onshore. While unmanaged permanent forests may generate fewer export opportunities in terms of quality logs, they could provide vast opportunities for alternative wood uses eg fuel sources (bio-fuel), pulp and chip for paper and building products, and other domestic processing opportunities (if investment in onshore processing facilities is made).

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

Yes. However, the mechanism of using the price of carbon is just one way of driving the reduction of gross emissions. The statements and modelling around the rate of afforestation need to be carefully looked at as there have been other drivers that have resulted in the increase in afforestation in the last year. With the changes to the ETS that came into force in January 2023 with the permanent and averaging categories, there was a lot of afforestation that was undertaken in 2021 and 2022 to ensure the plantings fell into the previous stock change model of carbon accounting to make use of the ability to earn carbon credits over multiple

[redacted]

[redacted]

rotations. Once the changes in categories were implemented, coupled with the severe uncertainty around the proposed changes to the ETS, has severely reduced the amount of afforestation currently being undertaken. Further modelling to reflect this would give a better understanding of when the net 0 targets will be reached. This could indicate that the rate of afforestation is actually on course with the Commission's initial assumption of 0.6 million ha /year. This more targeted modelling would confirm if there is, in fact, an oversupply of credits on the market, or whether this has now leveled off due to the recent uncertainty that has been created about the market.

As mentioned, the price of carbon is only one way of driving down gross emissions. Other ways also need to be considered and used in conjunction with the NZ ETS to reduce gross emissions including financial incentives to convert to alternative energy uses, investment in alternative infrastructure projects, etc. Reliance on one entity (the NZ ETS) as the sole driver for gross emissions is very risky as it is subject due to market (and Government) driven forces.

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

No. At the recent decision by the Government to accept the Climate Change Commissions recommendations for price settings in the New Zealand carbon market, it was announced by Hon James Shaw on 18th July 2023, that the “cost-of-living impacts were expected to be minimal – a $10 rise in the price of carbon would only add $167 to the average households weekly income” This would equate to an annual increase in household costs of $86 as opposed to the $500 reported in the discussion document.

There is a vast difference between these two figures and so further, robust modelling of the financial impacts is needed to determine what the actual financial impact on households will actually be.

3.3 How important do you think it is that we maintain incentives for removals? Why?

The assessment is heavily weighted toward electricity as an alternative fuel source. A total reliance on electricity could drive up the price for the commodity, especially if it becomes in short supply due to climate change (eg through the lowering of hydro levels, flooding of infrastructure, etc.). Modelling for other, alternative fuel sources should also be considered especially around bio-fuel and potentially bio-char. Diversifying the fuel source available to individuals, industry, and businesses may not result in a higher price to consumers. However, in order to invest in these other fuel and energy sources, incentives must be given to allow businesses to make the relevant changes. This could be achieved through monetary incentives rather than the current industry allocation of credits approach.

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

Yes. The NZETS has provided economic opportunities to Māori on land which was previously marginal and unproductive. Carbon credits have provided an income source as well as the forest providing employment opportunities. This is an important income source to iwi and hapu and provides opportunities for communities to invest in improvements for local communities.

Outside Māori land, the employment opportunities the forestry sector provides to Māori are very important. The forestry sector provides important opportunities directly to rural Māori communities and allows for whanau to stay connected to their whenua. This is through all aspects of forest management from afforestation through to the harvesting and the management of permanent forests (through fencing and ongoing pest control). It also provides indirect opportunities through opportunities available to truck drivers, sawmill and wood processing workers, whanau and community support workers, schools, etc.

[redacted]

[redacted]

4.2 What other interests do you think are important? What has been missed?

Developing the economic potential of indigenous vegetation is also another opportunity available. Through the encouragement of indigenous vegetation planting (either directly or through the use of an exotic tree species acting as a nursery for the natives) the opportunities to grow and manage indigenous vegetation for commercial purposes through essential oils, nectars, and other non-wood forest products could provide further income opportunities. The development of these opportunities can be funded through the economic opportunities carbon credits and the ETS provide.

4.3 How should these interests be balanced against one another or prioritised, or both?

Māori have a strong kaitiaki and rangatiratanga role and responsibility for the environment all interests should be considered equally as they are all reliant on the balanced interaction of each other. No one interest has priority over another in te ao Māori.

4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

With 3 of the 4 options of the review suggesting the price of NZU's will be predominantly driven by Government intervention on price, any opportunities for Māori to benefit may be limited depending on the Government's priorities at the time. An example of this has recently occurred when the Government ignored the Climate Change Commissions' advice to raise the cost containment reserve as they believed this would add to the cost of living crisis. This in turn prompted the sharp decline in the price of an NZU which was detrimental to all forest investors including Māori.

For opportunities for Māori interests to be realised, there must be confidence within the carbon market. Stabilisation of the carbon market would allow for further investment into their forest asset through developing these other forest products will help to create a more consistent income stream over and above that provided by the NZ ETS.

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

Yes. Prioritising and incentivising gross emissions reductions will result in the up-take of, and investment in, low-emissions technology as this will ensure better profitability in the long run.

However, consideration must be made to allow time for the effect of gross emission reductions to be felt. As mentioned earlier in this submission, consideration of the length of time that it takes to implement gross emissions needs to be considered. It takes time to invest and implement new operating systems and then for the effects of the new systems to have an impact on gross reductions. Allowance for this needs to be considered.

The NZ ETS should not be considered the sole mechanism to prioritise gross emissions. Investment in new technologies, alternative fuel sources, etc. must also be undertaken in conjunction with the NZ ETS.

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

Yes. See above

[redacted]

[redacted]

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?

Yes. As the NZ ETS is the main driver within New Zealand to meet international climate change obligations, incentivising the uptake of low emissions technology to reduce the financial burden and change habits is best done through the market constraints of the NZ ETS in the short term.

However, other drivers must also be considered. Investment in time and infrastructure/technology is needed as well in the medium term to also help meet the climate change goals.

Reliance on the NZ ETS should not be the sole driver.

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

The level of Government intervention and/or control should be a key consideration. As evidenced by recent Governmental intervention, the market can be severely impacted by policy. The NZETS should be allowed to function in an open market with little or no Government intervention. Market supply and demand and financial pressures will accordingly ensure the market will drive emissions reductions and pricing.

Operating the NZ ETS through the Climate Change Commission without government control in a similar way to the role of the Reserve Bank in providing stability to New Zealand's financial sector should be a serious consideration in providing neutral stability and certainty within the carbon market and not exposing it to pressures of Government policy.

5.5 Are there any additional criteria or considerations that should be taken into account?

Further modelling is required before any of the options mentioned in Chapter 6 can be realistically commented on. There is an obvious discrepancy in the effect of an increasing carbon price on household incomes (as discussed in question 3.2). There is also a discrepancy in some of the data used in the discussion document (eg the actual reason for the increased afforestation in 2022). No cost/benefit analyses have been provided for any of the options either. In order for an unbiased, fair, and considered recommendation on proposals to be made, more accurate data needs to be supplied.

6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

Option 2

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

As mentioned in question 5.5 the data used to form this discussion document appears to be flawed. While 4 options have been presented for comment, there has been no evidence provided that shows that any of these 4 options would be better than the status quo of keeping the current system.

While issues around the level of carbon reductions and the rate of afforestation have been identified, as not all criteria to determine the reasons for these issues have been looked at, it is hard to determine that the status quo needs adjusting.

6.3 Of the four options proposed, which one do you prefer? Why?

Option 2: As this could enable increased investment/pricing for credits obtained from indigenous/restorative forests.

[redacted]

[redacted]

However, it is identified in this option that the Government is not sure what the demand from off-shore buyers will be. As this is an unknown, to make the statement 'this option is only expected to be marginally more effective than the status quo' is not a reason to reject this option. To be able to make a full and informed choice on this option, however, more data needs to be provided around the costs and benefits of Option 2.

With the recent announcement from the EU about limiting the issuing of their carbon certificates, more demand from overseas markets may well be quite high.

Option 2, as it stands, also allows for the development of a voluntary market. This could be a positive opportunity for indigenous forests. A national voluntary carbon market standard could be developed as part of this option to allow for more investment in long-term, indigenous carbon credits.

6.4 Are there any additional options that you believe the review should consider? Why?

No. The other options rely on a large degree of Government intervention which, given recent Governmental decisions on accepting expert recommendations, would create uncertainty within the market and it may not achieve its full potential, to the detriment of all New Zealanders.

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

The development of a voluntary carbon market standard is required to ensure that trading in this market is recognised and meets international standards. This will allow those operating in this space to be complying with a standardised set of rules and expectations in this market that are clearly defined for all participants.

7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

Yes. Incentivising environmentally beneficial activities would encourage more to occur. This would encourage more long-term carbon storage in indigenous forests and would offer opportunities to land owners who currently have areas of reverting indigenous vegetation, those that want to establish new native forests, and offer opportunities to those that have to set aside land for regulatory purposes (riparian planting, Significant Natural Area designations, etc.)

However, it should not be limited to just indigenous afforestation. The co-benefits of stabilisation planting of exotics as well as the planting of exotics with a view to transitioning to indigenous over time should also be included.

7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

Option 2 as this provides for more free-market-driven opportunities from within New Zealand and Overseas. Other options offered are more government-controlled and rely on government decisions for setting prices. As past history has shown, the government of the day can choose not to accept recommendations and make decisions based on outside/short-term political pressures. This would cause some uncertainty within the market and may not realise the full potential of opportunities.

Option 2 allows for the development of a voluntary carbon market which could attract greater interest and investment from overseas.

7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?

No. If these are included in the ETS, but do not contribute to New Zealand's NDC, then this could have a negative impact on our ability to meet international targets set and our Climate Change obligations under the Net Zero Act.

[redacted]

[redacted]

However, while the inclusion of a wider range of removals may be beneficial to land owners until there are clear and recognised measurement tools and criteria developed it should not be considered. If once these are developed, and if they meet recognised international standards, then further investigation into incorporating them into the NZ ETS can be undertaken.

7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

The development of a voluntary market standard and the recognition of additionality could be effective in rewarding co-benefits.

The development of a biodiversity credit system could also provide rewards.

However, in the development of any other mechanism thorough, robust, and unbiased research must be undertaken in order for it to be effective. The mechanism must be put in place for the right reason, in the right place for the right outcome.

[redacted]

Review of the NZ ETS

And

A redesigned ETS Permanent Forest Category

11 August 2023

NZ ETS Review,
Ministry for the Environment,
P O Box 10362,
Wellington 6143.

By Email: etsconsultation@mfe.govt.nz

Submission on the Review of the NZ ETS and a Redesigned ETS Permanent Forest Category.

Individual Name / Name of Organisation	[redacted]
Postal Address	[redacted]
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Email address	[redacted]

[redacted], chair and coordinator of [redacted] agrees to the publication of this submission by the Ministry for the Environment, subject to removal of postal address, telephone number and email address above.

Introduction.

1. This is a submission by the [redacted] on the Review of NZ ETS and a Redesigned ETS Permanent Forest Category.

[redacted] **Introduction.**

2. [redacted] administer Maori land in the Tairawhiti region. We have come together to respond to issues and matters of importance to us, our whenua, our people and our environment.

3 [redacted] currently manages 186,611 hectares of Maori land. The largest of us manages 46,000 hectares and the smallest of us manages 5 hectares. We are responsible to 145,935 owners, employ 300+ staff, manage $764 million of assets, and generate $53 million of business revenue for the Tairawhiti region and its many communities.

4. [redacted] members have diverse interests in agriculture, horticulture, forestry and other land uses[1].

[1] Summary of usage of Māori Rural Land: Pastoral 63%; Forestry 27%; Dairy 9%; Horticulture 0.5% and Arable (cropping) 0.5%, Federation of Māori Authorities Innovation Insights on Māori Rural Land & Governance developed by Will Workman Enterprises.

5. All of the Iwi / Post Governance Settlement Entities in the Tairawhiti region are members of [redacted] through their Maori land interests. [redacted] members whakapapa to all the government recognized iwi in the Tairawhiti region, being Ngati Porou, Te Aitanga a Mahaki, Rongowhakaata, Ngai Tamanuhiri, and Kahungunu ki Wairoa.

6. [redacted] members comprise the more developed entities responsible for managing Maori land in the region. Hence [redacted] are well positioned to engage in public policy discussions to provide a much needed perspective on the impacts and implications for Maori authorities, the lands Maori administer and the people we are responsible to in the region. . Our journey together continues to try and stay at the forefront of regulatory change that affects our whenua, whanau, communities and environment.

7. Conclusions that flow from the consultation include the following insights:

    a. The process followed by the Crown is not Treaty compliant and better working relationships with Maori landowners need to be undertaken.
    b. The restoration and healing of our Taiao and whenua is important to our members as this consultation and others progress.
    c. To achieve the outcomes from the review, being gross greenhouse gas emissions reductions separate from removals to meet our climate change responsibilities, implies from the consultation, more government involvement and better management than the current uncertainty and ETS non-performance, and also a transition from status quo to option 4 proposed for the ETS.
    d. Option 4 needs to be simple and provide clarity around long term pricing on NZUs in tandem with eligibility rules around NZUs that can be used in greenhouse gas emissions reductions and separately for removals. Time is of the essence.
    e. There will be much work to be done by government and to a lesser extent local councils to implement and allow proposed ETS option 4 to be successful. This includes the work needed to redesign the ETS permanent forest category. Government and local council performance to date has been disappointing. Unless both step up, we will fail to meet our obligations and our whenua, whanau and communities will continue to be the poorer for it.
    f. The implications of this consultation for Maori landowners will be significant, complex and transition and adaptation will be needed to move forward. This will change the relationship we all have with the land. Having said this, there must be a fair and just transition for Maori in recognition of the lower impact of Maori land use and the extra challenges we face. To achieve this, Maori landowners need to work with Government and local Councils in co-designing the ETS and Permanent Forest Category for the benefit of the country and Maori.
    g. [redacted] is happy to be part of a funded Maori landowner expert group to assist local councils and central government officials to work towards achieving our climate change outcomes.
    h. [redacted] tautoko submissions from the Federation of Maori Authorities (FoMA) and Nga Pou a Tane (Maori Forestry Association) and its constituent members.

[redacted] Response to the Consultations.

8. We understand and appreciate that the NZ ETS is this country's primary vehicle to meeting our international climate change commitments and that it is failing to do so. The consultation has quite correctly identified gross greenhouse gas emissions reductions are required, separate from removals to honour our commitments.

9. We have considered the Review of the NZ ETS and a Redesigned ETS Permanent Forest Category discussion documents together as they raise matters that are complementary to each other. Further, aspects of each need to be considered together to ensure that we meet our international commitments in a way that also satisfies other national outcomes and aspirations.

10. Our Taiao or environment and whenua is important to our members to restore and heal, which is covered by other legislation in parallel, such as Te Mana o Te Wai and the future of Resource Management as well as the realities of the devastation caused by floods and cyclones and the remedial actions that will ensue. It is important that these matters are kept in mind in terms of this consultation. [redacted] members have adopted an Integrated approach for all the issues that impact on our whenua.

11. This submission is intended to provide insights on important key attributes required from each consultation to better empower our members to participate in a more climate resilient future.

[redacted] Comments on Review of the NZETS consultation.

12. The key drivers or outcomes the government seek from the review of the NZ ETS appear to us to be to:

    a. Reduce gross greenhouse gas emissions (gross emissions).
    b. Encourage carbon dioxide removals (removals) to meet emissions budgets and Nationally Determined Contributions (NDC) separate to reducing gross emissions.
    c. Pursue a fair transition to a low carbon economy at lowest cost and inflation to this country's households, in particular Maori as our most vulnerable.
    d. Propose solutions for the risks to the country meeting its commitments from there being an apparently large stockpile of NZUs held by ETS participants.
    e. Encourage co-benefits such as :
        I. Employment, economic returns, erosion control, and better use of unproductive lands, redesigned permanent forest category, develop a carbon removals strategy for wetland development and direct air-carbon capture, new and enhanced suite of NZ ETS look up table, develop a voluntary carbon market and role for biodiversity credits.

13. Options proposed to achieve this are:

    a. Retaining the status quo.

b. Option 1 : use existing NZ ETS levers to strengthen incentives for net emissions reductions.
c. Option 2 : create increased demand for removal activities to increase net emissions reductions.
d. Option 3 : strengthen incentives for gross emissions reductions by changing the incentives for removals.
e. Option 4 : create separate incentives from gross emissions reductions and emission removals.

14. To achieve the outcomes from the review implies from the consultation, more government involvement and better management than the current uncertainty and NZ ETS non-performance.

15. Status quo is no longer fit for purpose, as it appears unlikely to achieve the reduction of sufficient gross emissions to meet our International climate change commitments.

16. Options 1 and 2 are not fit for purpose either. Our understanding of these options suggest carbon prices would increase at a rate and to a point that will likely lead to an oversupply of NZUs in the market from forestry conversions. Such an outcome would not likely encourage reductions in gross emissions and will add to inflation.

17. Options 3 and 4 appear more reasonable. Our understanding of these options suggest there would be better separation between gross emissions and removals, with option 4 seeming to be the superior of the two options. That said, we do consider option 4 could only work if unit pricing and NZU flow are balanced or controlled to achieve the outcomes sought. This means a limited number of NZUs are available for emitters to purchase at sufficiently high enough NZU prices to encourage emitter reduction of gross emissions. Also high enough pricing is needed to encourage long term planning and planting of afforestation to meet carbon removal budgets. As such, we consider the government must ensure the NZ ETS system is simple and clear and provides current and future participants guidance to plan accordingly.

18. Government cannot afford for the NZ ETS to continue to fail to deliver on national emissions budgets and international commitments,

19. The mana of the NZ ETS needs to be restored. It is important that the ETS is efficient, is fit for purpose, is cost effective in the reduction of gross emissions, and is able to ensure we honour our international commitments over time.

20. For scheme participants, this means there must be clear decisions from government that give emitters the confidence to invest in gross emissions reductions. Likewise, forest owners must have the confidence to invest in long term planning and planting programmes to provide a limited number of NZUs for emitters to purchase to meet their emissions and the country to meet its carbon removal budgets.

21. Many Maori landowners have leased their lands to commercial parties for long term afforestation. Commercial parties are either harvesting with long term offtake agreements for the wood and long term forward contracts for free carbon with emitters. The leases generally mean Maori are only paid when the commercial party is earning income and depending on the lease may only be entitled to income from harvesting. Also the free carbon available for the market will be part of the NZU stockpile.

22. Solutions for the stockpile of NZUs should include improved information on the stockpile. NZUs held to meet harvest liability obligations from forests under carbon stock accounting have very different implications to liability-free NZUs earned from forests under averaging accounting. This information would support better-informed decisions being made on NZU pricing strategies that encourage both gross emissions reductions from emitters and removals for foresters.

23. Much has been made about the impact of the high price of gross emissions reductions in this consultation, namely that high NZU prices have an impact on inflation and cost flow on to households and the vulnerable in the country, many of whom are Maori. The consultation indicated the current impact to be 5% of inflation of currently around 7%, suggesting that other government policies than the ETS have more of an impact on inflation and flow-on effects on vulnerable households.

24. The discussion document makes a lot of the government's respect for the Treaty of Waitangi and the significant impact proposed changes will have on Maori. Maori landowners through Te Taumata have been trying to have a constructive relationship with government but have been ignored. Such behaviour by government questions their sincerity and commitment to the Treaty of Waitangi and engagement with those most affected by these and other consultations, being Maori landowners.

25. Co-benefits from the consultation can only be achieved through incentive pricing and scheme participants having the confidence to make informed decisions for long term planning and planting.

26. Proposed reforms to the ETS as described in the discussion document will have an impact on costs to participants, including Maori scheme participants. In our submission on *Forestry in the ETS: Proposed Updates to Cost Recovery Settings* dated 10 October 2022, we noted that all costs are going up in a way that profoundly impacts the ability of our smaller land blocks with no capital to participate in afforestation and in the industry. The limited opportunities for developing Maori land for longer term sustainability and self-sufficiency, means forest sinks represent the best use of many of these lands to support the aspirations of our people and ensure that we can retain ownership of our less economic lands.

27. It is useful to remind Government that most of our land is less productive lands, being LUC 6 to 8, and which is primarily suited to hill country farming and forestry. It should be noted that Tairawhiti is over represented by red-zoned erosion prone lands which further limits the potential for development and earnings from our lands. Likewise, the over-representation of Maori landholdings within the Tairawhiti region creates a particular sensitivity for the impacts on Maori authorities from government proposals affecting the

viability of planted areas on Maori land. Other related climate change regulatory reform is encouraging best land use on our lands which favours forestry over farming. Those regulations go further to encourage permanent afforestation over harvesting (due to sediment regulations being currently implemented), that will make it more challenging to harvest in future. So, there are/will be more of our people of the land entering the forest industry, as they will have few options other than forestry to provide for their whanau and communities from their lands.

28 [redacted] have just become aware of a recent study undertaken by Mike Marden[2], which provide useful guidance to the erosion prone land on the Tairawhiti. The local Council have already proposed a new Land Overlay 3B: purple zone for areas where farming and forestry should not take place. There are other guidance measures provided for discussion and resolution. This adds to the complexities of this consultation for Tairawhiti landowners.

[redacted] Comments on a Redesigned ETS Permanent Forest Category.

29. The key driver or outcome we understand the government seeks from a Redesigned ETS Permanent Forest Category is to maximise the benefits for climate, environment and landowners through the establishment of long-term indigenous carbon sinks by enabling permanent exotic forests to transition to indigenous forests over time.

30. We understand the consultation proposes three design choices to achieve this:
    I. Whether transition forests should be allowed in the permanent forest category.
    II. How transition forests should be managed to best ensure a successful transition.
    III. The rules that will best maximise the benefits of permanent forests in the ETS.

31. We further understand the consultation seeks to encourage other co-benefits and aspirations:
    I. From the NZ ETS Review.
    II. The improvement of forestry practices, through changes to the NES-PF and implementation of Integrated Forest Plans.
    III. The improvement of the environment through implementing resource management policies in district and regional plans and changes to the NES-PF.
    IV. Maximise the forest carbon programme to broaden the eligible carbon categories that may be included in the NZ ETS. Given the likelihood that some new categories may be outside the NZ ETS, means different pricing strategies will evolve, which flows through to long term forestry decisions and affect the extent to which the outcomes sought under this consultation will be achieved without pricing incentives. This work will ensure the continuing viability of Maori land holdings, our ability to support owner aspirations from what we earn from our lands and ultimately our ability to retain our ancestral lands as tangata whenua into the future.

[2] Land use sustainability in steep hill country Tairawhiti/Gisborne Region after Cyclones Hale and Gabrielle. Undated but believe July 2023.

V. The Tairawhiti and Wairoa forestry inquiry will impact on forestry practices given the extent of the devastation across the landscape in the Tairawhiti region.

32. To achieve the outcomes from the redesigned ETS Permanent Forest Category will need more government and local council involvement and better management from both. In the case of government, clarity around the regulations, rules and guidelines for the outcomes sought to guide players and local council in their implementation. With current regulatory change, clarity of regulations, rules and guidelines are happening at the same time as implementation. Implementation deadlines are also aggressive. Government funding needs to be more forthcoming in timeliness and amount to allow [redacted] members to transition as quickly as possible from regulatory change and flood recovery. Local council need to do their job better, for example holding those responsible for the silt and woody debris devastation from the last floods and future floods, being prepared, responsive and timely during disasters, floods and emergencies to the needs of the various affected communities, continuing to allow raw sewage to be discharged into Gisborne's waterways after heavy rains is a continuing issue, working with all groups, including Maori landowners that want to contribute to the future growth and prosperity of the region and so forth. Such improvements by government and local council then allow our whanau to build better and resilient communities.

33. Other issues to consider are:

a. Government and Council control means leadership from both should be based on sound science and proven outcomes. This means the costs to change or transition is sound, cost effective and sensible.
b. More bureaucracy means increases in costs and will impact on our smaller Maori land blocks. This impacts on the viability of those smaller Maori land blocks.
c. This controls what we can afforest on our land and what we can earn. The policies that central and local government put in place have a direct bearing on the actions we can take. This directly relates to how we can earn to support our people and retain our lands.
d. The NZ ETS controls the price we receive. NZU prices under the ETS determine what we can earn from our actions to support our people and retain our lands.
e. [redacted] are grateful that Maori owned land is proposed to be allowed to exist in the NZ ETS Permanent Forest Category. It recognizes best use for our whenua, and highlights the need to look after such forests when the earning potential from such forests cease and there will be ongoing obligations. Hence, that as custodians of our ancestral lands, we are well positioned to continue to look after our lands into the very long term so long as we can continue to earn enough of an income from these lands to both support the aspirations of our people and retain our ancestral lands.
f. [redacted] also note from the consultation of the presumption that native forests will eventually dominate the permanent forestry landscape in due course. [redacted] feel this presumption could lead to another ecological disaster in say up to 200 years' time, that is being associated with exotic forests now. We highlight again that the nature of our land left us is less than ideal, with most of our land being LUC 6 to 8, and being primarily suited to hill country farming and forestry. On the Tairawhiti, at least of 80% of our Crown Forest land would be zoned red due to its erosion prone susceptibility. We are aware that even before the coming of pakeha to New

Zealand, our erosion prone lands were moving even then with full native forest cover. A solution for those lands may be deep rooting species rather than natives. Some government research needs to be undertaken to provide the right tree in the right place for our lands as well as for other places like the top of the South Island. Given the importance of this work, it could hopefully be done by the next 5 years.

34. There are additional considerations to this consultation on NZ ETS Review and a Redesigned ETS Permanent Forest Category. They include:

    a. Collective accounting of NZUs and obligations by Maori landowners and others, how it will work and what is possible. An initiative indicated as possible by government for a collective like [redacted] to assess across their multiple businesses of being able to average out the highs and lows of their gross emissions reductions to meet our climate change outcomes. The highs and lows would be priced by experts to ensure there was fairness, transparency and settlement within the membership.
    b. Transitional forestry for exotics to natives, in particular the management of ETS liabilities over time. This has been discussed by government as possible to aid transition of faster growing exotic forests to native forests over a long time. Given natives are slower growing than exotic forests consideration needs to be given to managing ETS liabilities over the transition.
    c. Allowing Crown Forest Licence land to also transition over time to say natives to access additional carbon and manage ETS liabilities over time. Claimants to most of the Mangatu Crown Forest Licence are expected to receive it as part of a resumption settlement in due course. The covenant for the licence allows for harvesting, but given most of the Mangatu Forest is on red zoned erosion prone land, harvesting is unlikely to be a possibility in the future. Hence the forest may need to transition to a permanent exotic forest, being least cost, or transition to either a permanent native forest or a deep rooted forest should potential income make transition attractive. ETS liabilities will need to be managed similar to the ETS liabilities associated with wind throw damage to forests, where the liabilities are not enforced provided the forest is allowed to recover.
    d. Integration of a farm-level split-gas levy for agricultural emissions that would price emissions from biogenic methane and nitrous oxide (including from fertiliser) with NZU offset options. The multiple interests of Maori authorities on the Tairawhiti in sheep and beef farming, forestry, horticulture, quarrying, honey and so forth, mean that what is done here has an impact on the decisions Maori authorities make on land-use. The long term implications of land-use lock-in that come with planting forest sinks on Maori land for future generations and the likelihood of potentially losing our lands if we don't take that step to plant trees. We have to make best use of our land for the current and future generations and government need to understand that there are multiple vectors upon which they are driving us into making decisions we would rather not regret in the future.
    e. Government have indicated future budget shortfalls on meeting our National Determined Contribution of several billion dollars, and would need to buy offshore carbon units to meet the shortfall.. [redacted] do not support Government paying any potential climate change shortfall to meet our global obligations when we have advocated the solution is here in New Zealand with Maori landowners and others

planting more forests, in particular permanent exotic forests. To encourage participation in this project, government pricing needs to be attractive.

f. The unintended consequences of Pre-1990 Maori native forests used by the nation to join the Kyoto Protocol, means we affected Maori landowners bear as administrators of those lands, the burden that we can't develop nor earn an income from those lands and how debilitating that is for those Maori land blocks with very limited options for either having small land holdings, or an asset they can't develop or commercialise..

[redacted]

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10 August 2023

Review of the New Zealand Emissions Trading Scheme
Ministry for the Environment
etsconsultation@mfe.govt.nz

RURAL WOMEN NEW ZEALAND (INC) SUBMISSION

Review of the New Zealand Emissions Trading Scheme

Introduction

Rural Women New Zealand (RWNZ) welcomes the opportunity to provide feedback to the Ministry for the Environment on the review of the New Zealand Emissions Trading Scheme (NZ ETS).

Comments

1. RWNZ considers the existing ETS framework not fit-for-purpose for incentivising the necessary behaviour changes required to reduce emissions. We do not consider 'planting our way out' as an appropriate response to be relied on.

2. We believe the framework should consider more than the income earning potential of people or companies planting trees.

3. The proposals risk penalising those who have been proactively working to reduce emissions if there is a higher price to pay for getting ahead of the deadline when reduction requirements are applied.

4. Of significant concern also is the potential loss of highly productive (for growing food) land, harm to biodiversity and damage to the natural environment on which rural communities are so reliant.

Thank you for the opportunity to provide feedback.

About Rural Women New Zealand

Rural Women New Zealand (RWNZ) is a not-for-profit, member-based organisation that reaches into all rural communities to provide a credible and respected voice on rural environment, health, education, technology, business and social issues.

RWNZ strives to ensure that all rural residents, workers and families have equitable access to services, inequalities are addressed by Government, and the wellbeing of rural communities is considered from the beginning of all policy and legislative development.

RWNZ is affiliated to the Associated Country Women of the World and as such upholds all United Nations, International Labor Organisation (ILO), Food and Agriculture Organisation (FAO) and World Health Organisation (WHO) conventions and outcome statements as they relate to women and rural women in particular.

Nāku iti noa, nā

Gill Naylor

Gill Naylor | National President | Tumuaki Mataamu

Rural Women New Zealand
Ngā Wāhine Taiwhenua o Aotearoa
[redacted]

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Strengthening, Supporting and Connecting People and Communities

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Redesigning the NZ ETS permanent forest category consultation
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Selwyn District Council joint submission on the Review of the New Zealand Emissions Trading Scheme and a redesigned NZ ETS Permanent Forest Category

Introduction and context

The Council welcomes the release of the above discussion documents and notes the intention that any changes to the NZ ETS would be subject to further public consultation on the detailed design of proposals.

The Council previously made a submission on *Te hau mārohi ki anamata* | *Towards a productive, sustainable and inclusive economy,* Aotearoa New Zealand's first emissions reduction plan (ERP) and also on the recent discussion document relating to proposals to amend the Resource Management (National Environmental Standards for Plantation Forestry) Regulations 2017 (NES-PF). As such we support action necessary to move to a low-emissions economy and meet national emission reduction targets in a manner that also supports achievement of wider environmental outcomes. Comments made in this submission should be read alongside the broader or related points covered in these previous submissions.

We also note that a submission has been made by Canterbury Regional Council (Environment Canterbury) and wish to state Council's broad support for the additional matters raised therein.

Review of the New Zealand Emissions Trading Scheme

Selwyn District Council sees the ETS as an important market-based tool (alongside implementation of the wider suite of tools, levers and policies covered in ERP) to help achieve emission reduction targets.

We agree with the analysis mentioned in the report that in its current form the ETS is unlikely to achieve gross emission reductions at the scale and pace required to deliver on our national emission reduction targets.

We also agree that current carbon prices in the ETS, and the relative costs of reductions versus removals, are driving exotic forest planting as the predominant response. We note that Aotearoa is one of the only countries in the world which does not limit the number of units from carbon removals that can be used by emitters to pay for their emissions.

Council accepts that exotic forests have a role to play in the NZ economy and with regard to purposes of the ETS. However, we believe that the current structure and settings of the ETS require amendment to prioritise emission reductions and better support achievement of wider environmental outcomes.

Figure 10: Proposed options to strengthen the incentives for gross emissions reductions in the New Zealand Emissions Trading Scheme

The Council makes the following specific points in relation to the matters and options outlined in the discussion document (as shown in Figure 10 from the consultation material, reproduced above):

- We concur with the Climate Change Commission's advice that Options 1 and 2 would likely be ineffective (at least in the medium to long term), could undermine achievement of domestic targets and would not support the potential for wider co-benefits.
- Options 3 and 4 represent the more fundamental changes required to ensure the ETS aligns with Government's commitment to prioritise emission reductions and would enable greater consideration of desired co-benefits.
- Council supports further investigation of Options 3 and 4 but acknowledges that this will take time and so should be undertaken in conjunction with implementing Option 1 (and possibly Option 2) in the short-term.
- Council notes that the impact of changes to the ETS review on forestry opportunities could be significant for Māori and that some Māori have expressed strong concerns in relation to how ETS changes could affect the economic opportunities of whenua Māori.
- Council supports the just transition principle outlined in the ERP and would therefore wish to see associated measures (within or outside of the ETS) as part of detailed proposals for change to address this matter and meet Te Tiriti o Waitangi obligations.

Council also wishes to highlight the following associated matters which are mentioned in the consultation material but need greater consideration:

- Council strongly encourages any further proposals arising from this review or other workstreams (such as the cited carbon removals strategy) to be holistic in nature and expedited to ensure timeframes are aligned and demonstrate an interconnected Government approach.
- Changes should integrate co-benefits that support wider climate and environmental objectives. Examples include:
    - ensuring the measurement of carbon capture from different forest types is robust and includes a wider range of species and biophysical processes that occur in such habitats (e.g. understorey, soil, fungi, etc)
    - incorporation of a wider range of habitats that can sequester carbon and deliver other desired environmental outcomes e.g. wetland and waterway margin restoration
    - consideration of the proposed biodiversity credit system and how this might interact with and complement the ETS and other Government mechanisms, levers and policies.

- The current scale of the stockpile of New Zealand Units (NZUs) under the ETS is inhibiting effective and timely gross emission reductions and needs to be addressed as part of any proposed changes.
- Uncertainties associated with changes to ETS are, and will continue to, affect investment decision-making so amendments need to be implemented quickly and ideally with cross-party support. This includes progressing a proposed system for the pricing of agricultural emissions.

A redesigned NZ ETS Permanent Forest Category

Selwyn District Council supports the Government's overarching commitment to achieving the right type, location and scale of forests, for the right purpose. Council acknowledges the intention to finalise amendments to the NES-PF later this year and has sought that these changes ensure effective forest management in a nationally consistent way and that councils are enabled to effectively control the location and scale of afforestation in their districts.

Council makes the following specific points in relation to a redesigned Permanent Forest Category within the ETS:

- Under current settings the relative economic returns associated with the ETS permanent forestry category favour exotic afforestation (predominately *Pinus radiata*) and Council believes a proliferation of such monocultural forests carry risks and will likely cause adverse and ongoing environmental effects if left unchecked (including but not limited to wilding pests, soil stability and fire risk).
- We support the outcomes and assessment criteria listed in Chapter 5 of the document and used to guide the proposals. Should any weighting be applied to these criteria in finalising proposals Council supports greater importance being applied to the sequestration and broader environmental benefits criteria for the purposes of this ETS category.

Design Choice 1 – Forest Types

- Exotic forestry provides an important contribution to the NZ economy and landowners can financially benefit through registering such forests under the standard forestry category of the ETS.
- Decision-making for participants under the permanent forest category will be significantly guided by the relative financial returns resultant from the different forest types included in the category. If the permanent forest category is structured to provide greater incentives for indigenous forests relative to exotic forests then the impacts of a decision on which forest types to include is lessened.
- For example, the consultation document outlines options for carbon accounting methods in relation to supporting transition forests but such mechanisms should also (or primarily) be applied to counter the identified barriers to indigenous forests.
- Council therefore considers that as a market-based tool the ETS should first consider how to rebalance the financial aspects of landowner decision-making to favour indigenous forests within a redesigned permanent forest category.
- If the above approach is considered too complex or unachievable then Council supports restricting exotic forestry within the permanent forest category. This would be through Option 1.1 if redress for impacts on whenua Māori are provided through mechanisms outside of the ETS or Option 1.2b if the preference is for internalising this issue within the ETS.
- Irrespective of any decision on which forest types to include in the permanent forest category, Council views herein presuppose that controls on the location and scale of afforestation will be significantly strengthened through the upcoming amendments to the NES-PF.

Design Choice 2 – Transition Forests

- Despite the theoretical benefits of enabling exotic forests to transition to native plantings over time, Council is very sceptical of how such intent could be effectively delivered within the ETS.
- If transition forests are included in the permanent forestry category Council would like to see consideration of how pre-1990 exotic forests could be included to facilitate the potential for wider environmental outcomes and additional removals from this existing stock.
- Council recognises that stock change accounting is not an appropriate carbon accounting method for transition forests and further work is required to establish a suitable carbon accounting method.
- In relation to design choice 1, should transition forests be permitted to enter the permanent forest category, Council considers that a precautionary approach would be to allow long-lived exotic species as a nurse for native establishment. Further research on the effect of exotic canopy species on understorey regeneration is also required to support any future decision-making on transition forests.
- The potential success of transition forests is relatively untested and is a potentially broad-brush approach to a complex issue. A variety of factors, including rainfall, native seed source, bird populations, soil types, plant and animal pest management, and forest management will need to be considered when making decisions about the placement of transitional forests.
- Council is concerned of potential environmental issues that may arise due to senescence of even-aged monocultures, in particular *radiata* pine forests.

Design Choice 3 – Permanent Forest Management

- Effective forest management and an adequate monitoring and enforcement regime must be critical components for all permanent forests entering the ETS and Council supports Option 3.2 of the design choices outlined in the consultation document in this regard.
- Council supported the proposed amendment to the NES-PF to require Forest Management Plans (FMPs) and considers such plans as a good practice requirement for all sites seeking to gain NZUs under the ETS.
- As stated in Council's previous submission on the amendments to the NES-PF, additional forest management requirements to ensure the viability and risk management of transition forests is particularly important. Council considers there is much uncertainty for this novel forestry model and thus transition forests require a responsive and precautionary approach in respect of forest management requirements.
- Council would wish to see further details and proposals regarding the nature of management and compliance approaches but would favour a more prescriptive approach used as a default with an alternative solutions pathway (perhaps similar to that enabled for construction under the Building Code) for participants seeking to adopt other management models.
- Councils supports the VADE approach outlined in the document that enables compliance to escalate as necessary but strongly urges that the chosen regulator is enabled to undertake full cost recovery and develop sufficient capacity to perform its role.
- Compliance regimes could also be linked to accreditation schemes which recognise and reward those demonstrating responsible stewardship practices by easing the level of scrutiny sought from such landowners.

Climate and biodiversity action and experiences in Selwyn District

Selwyn District Council is committed to action on climate change. We were an early signatory to the New Zealand Local Government Leaders' Climate Change Declaration 2017 and have adopted a formal climate change policy that directs our mitigation and adaptation work and guides the organisation's planning and decision-making.

Council is also actively pursuing biodiversity protection and restoration work in the district - directly on Council, agency, and private land, developing partnerships with others and by facilitating projects through an annual Selwyn Natural Environment Fund. A Selwyn Biodiversity Strategy is in preparation and anticipated to be finalised early next year.

Forestry has been growing in the Selwyn District in recent years. Independent economic analysis determined that forestry was valued at 13.3 million New Zealand Dollars (NZD) in 2021 prices representing a 0.5% share of local gross domestic product last year. Council has a number of small forestry sites with a cumulative area of 122.2 hectares. These forests are pre-1990 forests and are included under the existing ETS framework.

Council staff have noticed an increasing number of resource management enquiries regarding permanent exotic afforestation in the district over the last two years. Large-scale increased forestry on the Canterbury Plains (including the associated highly productive land) is considered unlikely due to higher value land uses and the risk of storm damage. However, Council is concerned that inappropriate exotic forestry planting, supported by incentives under the current ETS settings, will occur on marginal but regenerating land in the Canterbury foothills.

Thank you for the opportunity to provide this submission. While we have provided comment on recognising and providing for Māori interests, we would expect Central Government to engage directly with mana whenua in relation to this issue.

For any clarification or discussion on points within this submission please contact Selwyn District Council's Sustainability Lead, Keith Tallentire – [redacted]

I acknowledge and accept that this submission may be released publicly including being published on respective Ministry websites.

Nāku noa, nā

On behalf of the Selwyn District Council

Sharon Mason
Tumu Whakarae | Chief Executive

SILVER FERN FARMS

Submission to the Government's consultation on ETS review and redesign of the permanent forestry category

SUMMARY

Silver Fern Farms supports fair, equitable and well-designed regulation that recognises and responds to the diversity in the New Zealand farm system, and supports our farmers to be leaders in nature positive food production

Submitted 25 August

Background

Silver Fern Farms is backing New Zealand farmers to lead the world as nature-positive food producers.

Established in 1948, Silver Fern Farms is a market-led food company with the purpose to create goodness from the farms the world needs. We are New Zealand's leading processor, marketer and exporter of premium quality lamb, beef, venison, and associated products to more than sixty countries and regions.

Silver Fern Farms is 50% owned by a co-operative of farmers who supply us produce and receive dividends based on the company's performance, and 50% by Shanghai Maling – a large Chinese food manufacturing, distribution and retail company.

Silver Fern Farms consists of fourteen processing sites spread throughout both islands of New Zealand, three regional hubs – in Christchurch, Auckland and Hastings and a corporate office based in Dunedin. We have a hub in Shanghai and in-market offices in the USA, UK and Dubai.

We are deeply connected to the fabric of rural New Zealand. At peak seasonal processing we employ over six thousand staff across our sites. Our farming network is extensive with over 16,000 farmer suppliers nationwide.

In 2022, Silver Fern Farms Limited earned revenue of $3.3 billion and delivered a net profit after tax of $189.3 million.

A market-led leader in the primary sector

Our Plate to Pasture strategy is critical to our success. Our approach starts with the customer first and steps back through the supply chain to our farmers.

Figure 1 Silver Fern Farms 2030 Strategy

This approach shapes the way we currently view the future of food production in New Zealand. Communities, consumers, buyers, and regulators expect companies to go well beyond compliance and to articulate how they're addressing major global challenges, from climate change to gender equity.

As an industry leader we want to be open about the challenges we face as a sector, take responsibility for the impact of our business, and support our food producers to succeed on the global stage.

This is why we have placed sustainability and creating sustainable value at the heart of who we are and what we do, and why we are optimistic about the role New Zealand farmers can play in leading the world in nature-positive food production.

Figure 2 Silver Fern Farms Sustainability Action Plan

Silver Fern Farms is proud to be supplied by farmers who want to be part of the solution to the climate crisis and want to hand their farms on in better shape than they found them. We are committed to becoming the world's most trusted nature positive producer.

We are optimistic that alignment between what is already happening on-farm, pragmatic and equitable regulation, and our commitment to extract the best value from the market will provide a future-fit, world-leading platform for New Zealand food producers.

We welcome the objective of a strong and steady carbon price signal that is sought through the ETS review. We agree that this review is required and reform needed.

From our perspective, the outcome of the ETS settings and permanent forestry category needs to reflect (and in some cases remedy) the following:

- Emissions pricing, offsetting and carbon markets need to be situated within a wider synergistic policy and economic approach to climate, transition, land-use and environmental management in New Zealand.
- A move away from carbon tunnel-vision, towards a more integrative nature-centered system that links climate change, social wellbeing and biodiversity outcomes and incentivises Nature-Based Solutions
- Strong alignment with market signals, and market-led instruments for abatement
- Gross emissions reductions should be prioritised especially in those sectors with clear transition pathways i.e. energy and transport
- An over-reliance on offsetting is driving the rapid loss of the iconic extensive farms and landscapes that brand NZ has been built upon
- Forestry itself is not the problem, forestry can be a positive asset within farm-systems both from a diversification, income and land-management perspective, but improved policy, pricing and regulatory guidance (including enforcement) is required

Current proposals risk "cart before the horse" policymaking; without greater clarity on outcomes, commenting on the possible design of the ETS mechanism is almost impossible

The proposals are generally confusing and difficult to unpick because key information needed to understand the full impact remains unclear. The consultation document surfaces several outcomes for what a revised ETS may achieve, but there is no clarity regarding the preferred objectives of the scheme. For instance, there is absence of information on:

- The balance of gross reductions and removals needed to achieve New Zealand's commitment to limiting global warming to 1.5C
- Outcomes being sought in regard to specific sector transition, including a summary of actions for gross emissions reductions under the relevant Emissions Reductions Plans

- He Waka Eke Noa outcomes, in particular a cohesive and systems approach to on-farm sequestration
- Biodiversity credits
- Implementation of Article 6 and impact on the Voluntary Carbon Market (VCM)

The issue of sector transition is particularly important, as we have seen that if the ETS and related settings are orientated too much towards one sector (i.e. forestry) then negative consequences and perverse outcomes occur in other areas of the economy

Without clear principles, direction and signals from the Government on preferred pathways, it is almost impossible to assess options for market design.

In our view all these issues are interlinked and designing market mechanisms without careful consideration of the interplays between the various drivers, policy linkages and scenarios increases the risk of unintended or poor outcomes.

1. ***We recommend that the government use the review to clearly set and communicate the desired high-level outcomes and objectives for the ETS (these could be reassessed at the conclusion of each budget period).***

2. ***We recommend further and more detailed analysis be undertaken on the price impacts, and land-use change impacts with a specific focus on food production, and rural communities; and this should be released before final decisions are made.***

Let's work harder to avoid carbon tunnel vision and take a nature-centric systems approach to climate action

Nature has a critical role in realising the triple dividend of sequestration, climate adaptation and biodiversity gains. Nature provides critical solutions for both mitigation and adaptation, and it must be protected or enhanced through our climate action.

Nature-based solutions are a key action in the Emissions Reduction Plan and should underpin any changes to the ETS. These solutions are often cheaper and more effective over the long-term than hard infrastructure, like seawalls. Nature-based solutions (NBS) include large-scale coastal and freshwater wetland restoration, riparian planting, the re-wetting of peatlands, and the establishment of permanent indigenous forests in erosion-prone areas.

We therefore agree that incentives should be strengthened for emissions removal activities with broader environmental outcomes and co-benefits beyond sequestration (e.g. indigenous forest biodiversity) and we see significant potential for complementarity with market-based programmes and incentives in this space.

As a company we have committed to a nature-positive future and are currently pursuing a range of initiatives to integrate nature-based solutions into our business model.

We are backing our farmers to continue their global leadership in pastoral food production and focussing on amplifying our own role to better connect customer expectations with producers and access premiums in global markets.

Figure 3 Silver Fern Farm's Supplier Value Stack incentivises nature-based solutions and emissions reductions on farm.

In terms of accelerating climate action, there is much to be gained by connecting to market signals and responding to these via incentivising positive on-farm practices. At Silver Fern Farms, we are backing these up with a range of market assurance and extension programmes to return increased value back through the farm-gate. These include supporting our farmers to implement nature-based solutions via our Net Carbon Zero and Nature Positive premiums and our soon-to-be-launched Good by Nature Fund.

Technology is often raised as a barrier to assessing and auditing on-farm vegetation or other nature-based solutions at scale. Through our Net Carbon Zero by Nature programme, we have developed tools that can do this work at scale and could easily be applied to verify an extensive range of sequestration and uptake of nature-based solutions.

This technology is affordable and scalable, equally for government as it would be for private companies. It is imperative that the Government considers and adopts appropriate technology as a strategic enabler to emissions reductions. Silver Fern Farms is happy to share experience in this area with MfE if it is useful.

Aotearoa/NZ has a huge opportunity to utilise this technology to undertake large-scale land, vegetation and biodiversity mapping and potentially become the first fully nature-mapped food producer, a position that would be extremely valuable in-market.

3. ***We recommend the government uses the review to explore opportunities and mechanisms that incentivise nature-based solutions within the ETS (preferably, if not then as part of a secondary market), including the accelerated entry of new categories such as riparian, wetlands and soil.***

4. ***We recommend that the government uses the review to more closely align and support market-linked programmes for NBS and abatement including Silver Fern Farms Nature Positive and Net Carbon Zero programmes.***

5. ***We recommend the government rapidly invests and rolls out large-scale land, vegetation and biodiversity mapping as a strategic enabler to unlocking the possibility of and investment in emissions reductions.***

6. ***We recommend that the government consider a large-scale land-mapping project to position New Zealand as the first fully nature-mapped food producer.***

Due to poor policymaking in relation to carbon farming we are rapidly losing the iconic farms and landscapes that our NZ Inc brand has been built on and threatening the livelihoods of many New Zealanders

We are concerned about the scale of exotic afforestation witnessed over the past years, and the misalignment between the incentives for permanent pine forestry and achieving gross emissions reductions. The impact of this on our business, the farmers and rural communities we support, is hard to underestimate. Unfettered and poorly managed afforestation is rapidly changing the face of rural New Zealand, creating shocking environmental risk and damage, and eroding the brand we have worked hard to build in overseas markets.

Research from Orme & Associates identifies the purchases of more than 175,000 ha of whole-farm sheep and beef farmland since 2017 for the purposes of conversion into forestry. Of this area 121,300 ha will be new afforestation on farmland. Most of the remainder of this occupied land area is in existing scrub and woody vegetation. In 2021, more than 52,000 ha of sheep and beef land were purchased by forestry interests, a 36% increase on the previous two years, and up from 7,000 ha in 2017. Of the farm area sold to forestry in 2020 and 2021, close to 40% involved was intended for carbon-only farming (i.e., permanent exotic forestry). Incidentally, about the same proportion involved purchases through the Overseas Investment Office.

The incentives are all wrong -- an average permanent pine forest in the ETS will earn 7.5 times more NZUs than an equivalent area of indigenous forest, but reduces jobs, foreign exchange earnings and productivity, as well as accelerating biodiversity loss and increasing the risk of fire, erosion, disease, pests, and the spread of wilding pines.

The design of the permanent forestry category in the ETS has taken the benefits that carbon farm owners gain and super-charged them, albeit in an extremely short-term way.

It is not surprising then that the Climate Change Commission now notes that the level of carbon dioxide removals by forests could exceed demand from NZ ETS sectors beyond 2030s causing a weak carbon price and consequently compromising gross emissions reductions.

The time for policy change is now, and as per the proposals there are many options available to the government that could better manage permanent forestry. We assess the following are the best pathways to deliver emissions reductions in a more equitable way.

7. ***We recommend that the government consider removing exotics from the Permanent Forestry Category with exemptions (economic benefits that would otherwise not be possible, such as on erosion-prone land or on marginal land where no productive activity is possible, or where it will help the Crown to achieve its Te Tiriti obligations)***

8. ***We recommend that the government consider limiting permanent exotic forestry offsets, as a proportion of total NZUs surrendered, which would align NZ with comparative schemes where limits are set in the 1 – 10% range.***

We want to be clear that forestry is not the problem, forestry can be a positive asset within farm-systems both from a diversification and land-management perspective, but improved policy, pricing and regulatory guidance (including enforcement) is required.

It is therefore important the Government commits to developing a sequestration strategy for New Zealand, and that any proposals relating to emissions pricing, and or discounting through incentives, are considered in a much more strategic way.

The strategy could agree the desired outcomes at a national-level: prioritise sustainable land use ('right-activity right-place'); resilient and thriving rural communities; maintaining and growing food and fibre exports; and be linked with the essential freshwater and indigenous biodiversity policy initiatives.

The strategy could include HWEN sequestration (farm-level off-setting), the NZ ETS (general off-setting) and the Voluntary Carbon Market, taking account of the interconnectedness of these.

- Provide a representation of current land use and sequestration opportunities.
- Consider desired outcomes at a national level, taking account of nature-based solutions (NBS) to emissions reduction and land-use.): NBS support a farm system approach and have the potential to deliver a triple dividend: both gross and net emissions reductions, biodiversity gains and climate adaptation benefits. NBS can also result in nature-positive products by creating a virtuous circle of co-benefits that amplify any investment. The strategy should therefore prioritise sustainable land use ('right activity, right place'), resilient and thriving rural communities, maintaining, and growing food and fibre exports, and be linked with the essential freshwater and indigenous biodiversity policy initiatives.
- Consider wider natural ecosystem benefits, with an aim to protect our natural capital.
- Address the ongoing need to offset carbon emissions and create a balance across the environmental, social, and economic benefits of exotics and natives.
- Introduce financial reward / offsets for permanent native forestry.
- Recognise on-farm sequestration opportunities, and the offsets from reforestation projects and community restoration projects, e.g. wetland restoration.
- Set the context for developing the necessary rules and standards to affirm the quality of new sequestration activities, while considering international developments with respect to the fungibility and quality of offsets. A process for monitoring and enforcing standards should also be considered.
- Recognise our domestic and international commitments to protect and enhance biodiversity
- Consider regulation that allows for inclusion of robustly proven sequestration pathways outside forestry and agriculture, to incentivise research and implementation of these options.

9. ***We recommend the government develops a sequestration strategy for New Zealand***

Finally, an ask for bipartisan climate policy

Bipartisan climate policy will give all sectors the certainty needed to make the upfront investments needed to accelerate emissions reductions to 2030 and support a just transition more broadly.

Additional Information and Contact:

Silver Fern Farms is happy to provide more information on our submission.

Contact: Catrina Rowe – Sustainability Manager, Policy & Engagement

[redacted]

3 Rivers Holdings Ltd
[redacted]

Ministry for the Environment PO Box 10362
Wellington 6143
etsconsultation@mfe.govt.nz

10 August 2023

RE: **Te Arotake Mahere Hokohoko Tukunga, Review of the New Zealand Emissions Trading Scheme Consultation Response**

Responder:
3 Rivers Holdings Ltd is an ETS carbon registered forest located in the Nelson Tasman area.

Our Response:
We are deeply upset by the continued solicitations for consultation responses by MPI and the ETS. These solicitation requests have the effect of destabilising the carbon trading market, increase volatility in price and serve to drastically overturn participants' trust in the scheme.

We, for one, have been adversely affected by the sell off of carbon credits and panic in the market created by this most recent announcement. Forestry owners are distressed that their credits may be deemed worthless overnight or subject to an overburdening state controlled market, whose objective seem to be cost motivated rather than following its mandate of carbon reduction. In addition, these potential changes are even more frightening to ETS forestry participants who have an ongoing liability with punitive penalties should their forests fall through adverse events such as wildfires or windstorms. Insurers are responding to these increased climate change risks by withdrawing from regions, reducing coverage and increasing premiums by 30% from the previous year.

The world is recovering from a pandemic and getting their heads around climate change. I believe enrolled ETS forestry owners view themselves as trying to assist with reducing CO2 in the environment through sequestration. It is really upsetting to consistently be rammed in the newspapers as greedy land grabbers, displacing farmers, creating pine wilding and slash/mud slides. When in fact, foresters have ongoing expenses relating to insurance, establishing and maintaining their forests and keeping them healthy and free from invasive plants such as old man's beards and pests such as possums and deer. Moreover, pundits like Dame Salmon continued opining that the ETS should be changed to exclusively reward native plantings do not understand the role that exotics species have in quickly sequestering carbon faster than natives.

Constant changes to the ETS also negatively impact foresters as we still don't understand the the current scheme works in relation to our obligations and the timing of selling our credits to fund aforementioned costs.

It is a mystery why the ministry would seek a consultation during a FMA measurement year when the industry is swamped. And it is baffling why they would change the software system during the same period. It seems that there is a lack of impact analysis done before these consultation requests are released. Potential impacts on foresters, emitters, the carbon markets, public opinion, pundits' responses should be considered prior.

It is also baffling why a consultation would be released during an election year saying that the recommendations and proposals would have zero binding. It is a waste of taxpayers money to go through this exercise and moreover has lost the government millions of dollars in revenue through failed auctions.

We are writing to register our disappointment and objection to this consultation. We urge MPI to withdraw or nullify it. It is our hope that administrators would work first on reestablishing confidence in the ETS and focus its priority on honouring our commitment to the Paris accords of keeping global warming to 1.5 degrees Celsius.

Moreover, MPI should reassure foresters and other participants that any massive overhauls should have grandfather provisions protecting existing participants from adverse changes and subsequent negative impacts. Otherwise, there is the impression that the government only self deals and will continue to undermine the ETS program by manipulating it to its own advantage regardless of how it impacts Māori, NZ's accord commitments, it's reputation, nor the ability to have a functioning carbon market.

The largest risk to the ETS is the government and its constant regulatory changes. This may unintendedly create a global impression that NZ acts as a state controlled command economy that changes its mind on a whim indifferent to its market participants and voting electorate.

Regards

SUBMISSION

Submission from Straterra to the Ministry for the Environment Review of the Emissions Trading Scheme

August 2023

Introduction

1. Straterra is the industry association representing the New Zealand minerals and mining sector (including coal). Our membership is comprised of mining companies, explorers, researchers, service providers, and support companies.

2. We welcome the opportunity to make this brief submission on the Government's Emissions Trading Scheme (ETS) review as set out in the discussion document, Review of the Emissions Trading Scheme (the document).

Key points

- We do not support a strategic shift away from net emissions towards gross emissions in the Government's climate change response. Likewise, we do not support using the Emissions Trading Scheme (ETS) to prioritise reductions of gross emissions.
- We do not support any of the four options provided in the document.
- There are other important policy changes that could be made to improve the workings of the ETS that are not canvassed in the discussion document such as allowing trading of international units and benchmarking carbon prices to those of our trading partners.
- Confidence in the ETS is at risk because of the lack of a clear policy direction.

Continual reviews are undermining the ETS

3. We are concerned about the continual tinkering with the ETS which is contributing to uncertainty and undermining confidence in the scheme. It must be left to do its job but the frequency and materiality of setting changes and reviews have damaged confidence in the ETS which is weakening investment in decarbonisation.

Gross vs net emissions / forestry offsets

4. From a climate science perspective, it doesn't matter if reducing carbon in the atmosphere comes about by reducing gross emissions (greenhouse gases that are released) or increasing removals of carbon from the atmosphere. A tonne of carbon permanently sequestered from the atmosphere is just as good as a tonne of carbon dioxide that is not emitted and so it is net emissions which matter for the science of climate change, not gross emissions.

5. This is presumably why the Climate Change Response Act 2002 was drafted with a net zero emissions target not a gross target and why the ETS is designed to meet the country's net emissions target.

6. It would be a major change of direction for the Government to shift the focus from net to gross emissions. Before adjusting the ETS settings again to achieve this, the Government should first come to a view that a shift from net to gross is the right strategy. (And we don't think it is.) The review of the ETS should not occur until after that issue is settled.

7. Gross emissions are declining and will continue to decline as the world shifts towards a low carbon economy including non-carbon emitting fuels and renewable energy.

8. If an easy way to reduce atmospheric carbon in the short term is to focus on removals, then we should not be discouraging that.

Exotic vs indigenous forestry

9. We do not think the review should be making value judgements about exotic versus indigenous forests. It is not the place of the ETS to achieve biodiversity outcomes.

10. We acknowledge the importance of indigenous forests, but the ETS is a policy tool to reduce carbon emissions and it shouldn't be used as a biodiversity instrument (just as biodiversity policy shouldn't be used to address climate change policy).

11. Exotic forestry is currently one of the lowest-cost and scalable sources of removals – more so than indigenous because it grows and absorbs carbon quickly. If emissions reduction is the goal, investment in exotic forestry should be welcomed.

12. The Government has a number of options outside the ETS to manage afforestation without undermining market signals in the ETS.

Government policy / Emissions reduction plan is undermining the ETS

13. The discussion document implies in a number of places that the price of NZUs is too low. Specifically, it says it is cheaper for emitters to pay for their emissions rather than investing in improving energy efficiency.

14. We do not think the NZU price is too low. However, we note that there is case to say that it is lower than it otherwise would be if the Government did not pursue policies designed to mandate how and where emissions should be reduced. For example, under the Government Investment in Decarbonising Industry (GIDI) Fund significant resources are allocated to encouraging emitters to switch out of fossil fuels, meaning they are taken out of the ETS as buyers of units resulting in lower prices than would otherwise exist.

15. These lower prices benefit more favoured emitters, but do not do anything to bring overall emissions down given the ETS's sinking lid on NZU supply.

16. Many of the regulations and policies to reduce emissions contained within the Emissions Reduction Plan (ERP) are not necessary for this reason. It is this, by definition, that will bring New Zealand emissions down, not the array of proposed interventions contained within the ERP which are interfering with the ETS and distorting the economy generally.

International units

17. Climate change is a global, not a local, phenomenon. The New Zealand ETS is incomplete in that it does not take account of carbon prices in international markets. Consequently, it risks undermining New Zealand's international competitiveness with no benefit for the world's climate.

18. In the absence of international carbon markets, we consider it is essential that the carbon price faced by New Zealand emitters (and the stringency of other policies to reduce emissions generally) parallels those faced by our international trade competitors and partners as much as possible, so we are not made uncompetitive, and emissions leakage does not result.

19. To this end, we recommend the ETS should contain a mechanism to benchmark the NZU price with a weighted average of our trading competitors. This could determine the price cap (and the cost containment reserve) which would be preferable to the rather arbitrary way it is currently determined. This would go a long way towards reducing the risks of carbon prices leading to carbon leakage.

20. Even though an international carbon market is not possible at this time, we consider New Zealand's ETS should be amended to allow some trading in international carbon units (from credible sources) by market participants.

21. One option in the interim would be for international units to be among the units introduced by the Government as part of the cost containment reserve.

New Zealand Farm Forestry Association
Oranga Rākau Aotearoa

NZ ETS Review
Ministry for the Environment
PO Box 10362
Wellington 6143
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9/8/2023

SUBMISSION ON
"Review of the New Zealand Emissions Trading Scheme"

Submitter:	New Zealand Farm Forestry Association Inc (NZFFA)
Address:	New Zealand Farm Forestry Association 9th Floor, 93 The Terrace, Wellington PO Box 10 349 The Terrace Wellington 6140
Submitted by:	Neil Cullen
About this organization.	The NZFFA represents people who own small-scale private forests and/or are interested in the many values of trees. Currently we have over 1200 members representing a good cross-section of the approximately 15,000 entities owning private forests in New Zealand. **Small forest owners represent more than 96% of the participants in the ETS**
Contact:	To discuss this submission you are welcome to contact: [redacted]

Contents

Summary

Our key concerns with the "Review of the New Zealand Emissions Trading Scheme" are:

1. **The confidence of forest owners, investors and participants** in the ETS has been badly shaken over the last 6 months. Following the Climate Change Commission's recent draft advice and the release in June of the current consultation document, there was a 60% reduction in the value of NZU's. Attempts in July to restore confidence have lifted NZU prices again, but have not reduced uncertainty. This has had two direct consequences:
    - It has all but destroyed belief in the value of further afforestation. We are aware of a number of forestry projects now on hold or cancelled.
    - It has led to a huge destruction of landowners' wealth, with the value of rolling hill country falling by around 40%.
2. **The loss of confidence comes on top of concerns** about the social license for forestry and other ongoing changes including the review of the ETS charging regime, the recent introduction of the National Policy on Indigenous Biodiversity and the review of the National Exotic Forest Description.
3. **The Commission's recent draft advice was challenged** by several emitters and as a consequence the Commission may modify its recommendations. If so, it seems inappropriate for the Ministry to use that analysis and draft advice as arguments for change. At best it will duplicate the Commission's own consultation process, and at worst it might pre-empt any improvement.
4. In the consultation document it says (page 21) that *"The Government has **accepted the Commission's recommendation** that (our) climate response should prioritise gross emissions reductions while maintaining support for removals."* The point is made several times, yet Question 5.1 asks *"Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals?"* Given the heavy emphasis on this point throughout the consultation document, it looks as if a decision has already been made.
5. **A key driver for changes to the ETS** is the forecast oversupply of forestry units from around 2035. The modelling provided does not seem to have considered the influence of the proposed changes or their impact on investor confidence. Furthermore, we are concerned that the modelling is based on misleading information, which we address in our response to Questions 2.1 – 2.4.
6. **We suggest that the analysis lacks robustness**. The Commission's draft advice that forms the basis of this review is limited. It does not include factors such as net immigration running at more than 50,000 people per annum, or the ability of the transmission network to cope with the transition to an electrified economy. The consultation document that draws upon this analysis canvasses several options to change the ETS, but it looks risky to change the role of forestry based on that source. It may be safer to closely monitor the situation over time and act on evidence rather than speculation.

7. **If there are to be controls on the amount of forestry** in the ETS, we suggest annual limits on the total forest area accepted into the scheme. That would have a low regulatory cost; would provide flexibility for the Government to react to unforeseen events; and might even generate revenue if the Government auctioned off the right to join the ETS. The option is contained in the Commission's draft advice and we recommend that it be analysed. Together with stronger controls on the volume of NZUs auctioned, the approach would seem to address most of the key issues in the consultation document as well as those raised by the Commission.

8. **We suggest the ability to "export" surplus NZUs would be useful**, subject to suitable controls on both export volumes and the area of forestry allowed to join the ETS. In that context, we support the changes proposed in Option 2. We also support the introduction of an expiry date on NZUs, provided that forest owners issued with units for forests under stock-change accounting should be able to hold those units until they need to be surrendered.

9. **We disagree with Options 3 and 4** as described in the consultation document.

10. **The consultation document ignores agriculture** as it is outside of the ETS. This is both shallow and irresponsible. If we accept that there are, as the review insists, serious *"reasons for prioritising gross emissions reductions while maintaining incentives for the removals"* then agriculture should be prioritised as it is the largest emitting sector. But given that currently there is no realistic option for farmers to reduce their emissions, it follows that the policy of prioritising gross emissions reductions is meaningless. On the other hand forestry removals can help in at least two ways. First, they will reduce the need to buy agriculture offsets from overseas. Second, forests planted on farm land will displace livestock and reduce methane emissions. We understand that the abatement effect of this is as much as 25% of the actual sequestration. To ignore this effect just because agriculture is not included in the ETS is illogical and we suggest that we need to look at the ETS holistically as an instrument to assist in meeting our NDC commitments.

Specific issues

Chapter 1: Why the Government is reviewing the ETS

11. The consultation document argues that because of the potential cost of delays we should prioritise gross emissions reductions now. This is not supported by any robust analysis, and we note that most technologies become cheaper over time due to economies of scale, better design, improved materials and stronger supply chains. Electric vehicles, wind turbines and photo-voltaics are examples. In fact our current approach to agricultural emissions is to "wait for the technology".

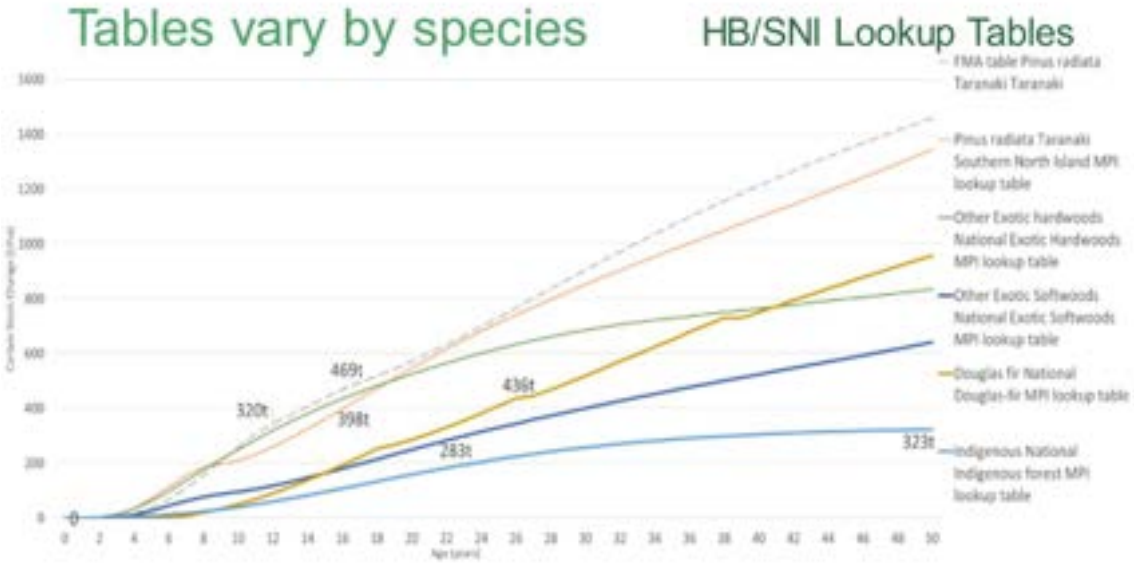
12. The consultation document argues that the ETS is not sufficiently driving those necessary gross reductions. We are not really surprised. It doesn't help that:

    - Half of our gross emissions are outside the ETS;

- The Government's ETS settings and policy announcements have kept the carbon price low;
- Our international commitments are actually based on ***net*** reductions, not ***gross*** reductions.

13. The consultation document argues that the ETS settings will not drive an 'appropriate' level of indigenous afforestation. Why should it? It was never designed for the purpose and it's like expecting a dog to drive a tractor. Indigenous forests are good for many things, but carbon sequestration is not high on the list. A permanent exotic forest can outperform a permanent native forest as a long-term carbon sink over several hundred years, and be cheaper to establish. While it would be nice to have more native forests, and the ETS is available, a better driver could be found.

14. Most exotics will sequester more carbon than natives and grow faster, as shown in the graph below. On average, a native forest will take hundreds of years to sequester its limit of about 900 tonnes of carbon dioxide per hectare. In comparison, many exotic species will store about twice that in 70 years and continue growing.



Chapter 2: Expected impact of Current NZ ETS

15. The projections in Chapter 2 and later Chapters are based on superseded information. The estimates from the MPI afforestation and deforestation intention survey (Manley, 2021a) published in July 2021 should be replaced with the figures from the latest National Exotic Forest Description (NEFD, March 2023) which is based on actuals rather than intentions. We also note that the Manley survey did not include small growers, which are the majority of ETS participants.

16. The difference between the figures in the intention survey and the NEFD is stark and significant. Between 2017 and 2022, according to the intention survey, the area in exotic forest would have grown by more than 150,000 ha. The official

NEFD statistic shows that over those years, the net stocked area grew by only 50,000 ha. This is a variance of 100,000 ha, which by 2030 would make a difference in sequestration of around 3 million tonnes of CO2e per annum, and overstate the issuing of NZUs by 3 million NZUs a year. To base policy decisions on figures that are so inaccurate invalidates most of the analysis on ETS incentives.

The NEFD figures are given in the table below.

Total Forest Area (hectares), as at 1 April - Source = NEFD March 2023

	2017	2018	2019	2020	2021r	2022
Area awaiting replanting	48,470	50,072	52,041	54,380	47,700	50,221
Net stocked area	1,706,429	1,704,494	1,696,604	1,716,575	1,739,971	1,757,451
Total forest area	1,754,899	1,754,566	1,748,645	1,770,955	1,787,671	1,807,672

17. While the CCC in its draft advice quotes a figure of 60,000 hectares of exotic afforestation in 2022, in reality the net stocked area only grew by about 18,000 ha. Indeed, over the last four years the average rate of increase has been only 15,000 ha a year. Rather than being at risk of planting too much forest, we are at risk of underachieving the Commission's 2030 benchmark.

18. Given the passage of time, the introduction of new regulations and the stumble of the carbon price following the publishing of the CCCs draft advice and this consultation document, we suggest that the forecasts used in the analysis are quite inaccurate and should be updated before any decisions are made on the future of the ETS.

Chapter 2 consultation questions:

2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?

No: see our detailed response above.

2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

Only what is reported in the media.

2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?

As a result of the stumble of NZU prices, seedling orders from forest nurseries this August have slumped. MPI should have figures confirming this. It is likely to cause a major reduction in afforestation in 2024.

2.4 Do you agree with the summary of the impacts of exotic afforestation?

No. We do not accept that the current Government modelling is based on adequate and timely input data.

Chapter 3: Driving gross emissions reductions through the NZ ETS

19. As noted above, the projections in Chapter 2 and later Chapters are based on superseded information. However we understand and agree with the main point of Chapter 3, which is that we need strong and stable ETS price signals.

20. We endorse a 'polluter pays' approach to emissions and confirm that we *"want the price that emitters face to be high enough that the decision to switch to low-emissions technology is the most cost-effective."*

21. *S*ince we are not emitters, we have no information on what those prices should be; but we accept that the design of the ETS could be adjusted to deliver a preferred price pathway, as long as it allowed room for improvement as more up-to-date information on the necessary prices came to hand. Clearly higher prices would have cost impacts downstream on households and industries, which would need to be managed.

Chapter 3 consultation questions

3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS?

Not entirely. First, the key measure in our NDC is a reduction of net emissions and second, the ETS and recent Government interventions need to be allowed to run longer before it can be said that the ETS does not drive adequate emissions reductions.

3.2 Do you agree with our assessment of the cost impacts of a higher emissions price?

Yes. Higher prices drive changes in behaviour.

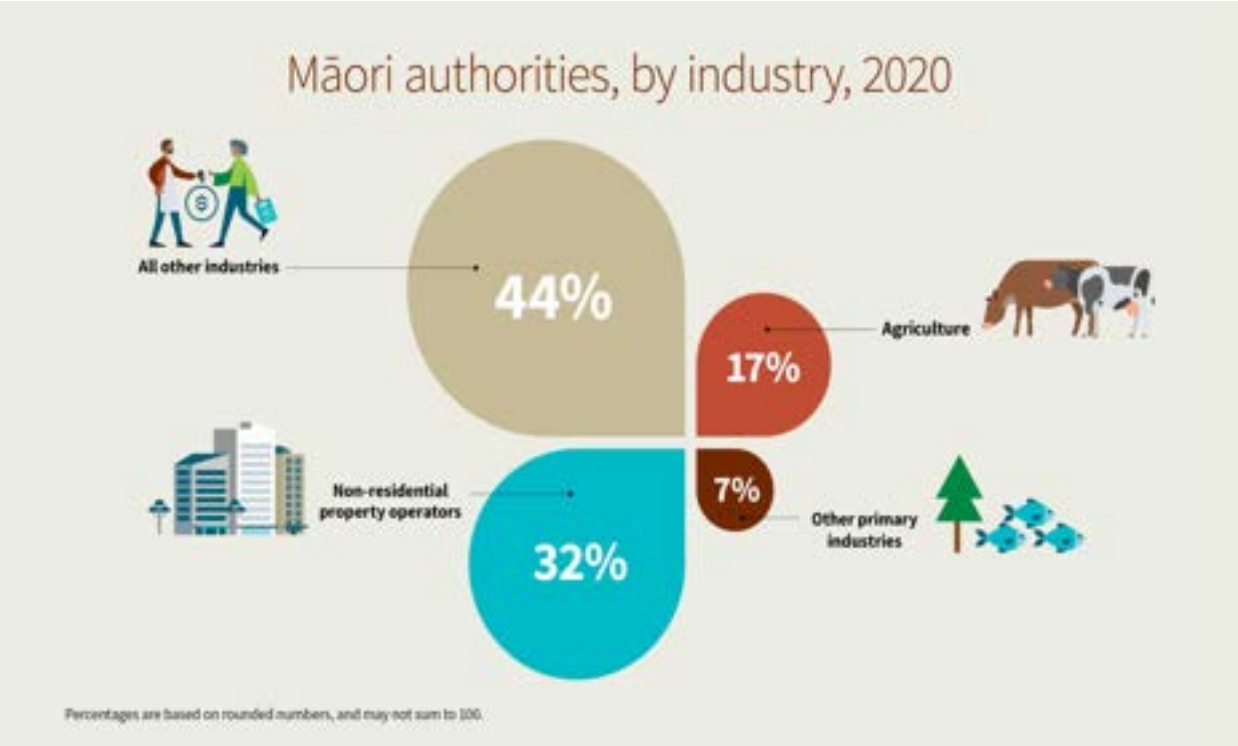
3.3 How important do you think it is that we maintain incentives for removals?

It is absolutely essential or we are at risk of not meeting our afforestation and carbon removal targets. Government would also lose faith with the whole sector and that could lead to a strong political backlash.

Chapter 4: Changes to the NZ ETS would be significant for Māori

22. We accept that to achieve an equitable transition for Māori, the Government needs to consider Māori interests, reduce barriers for Māori participation and avoid creating new inequities. We do note that Statistics NZ indicates Maori participation in the primary sector is only part of this country's total Maori economic activity. The Government will need to be careful that in creating an 'equitable transition' in one area (e.g. farming), it does not create a fresh inequity in another (e.g. tourism).

23. This graphic from Statistics NZ deals with businesses involved in the collective management of assets held by Māori. These employ 13,000 people and control assets worth $24 billion. Fewer than a quarter of them are in the primary sector.



Chapter 4 consultation questions

4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why /why not?

We agree with the description, but believe all participants in the ETS should be treated the same way, irrespective of their ethnicity.

4.2 What other interests do you think are important? What has been missed?

The interests of current forest owners have not yet been considered.

4.3 How should these interests be balanced against one another or prioritised, or both?

Not qualified to say.

4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

Not qualified to say.

Chapter 5: Objectives and assessment criteria

24. We are all in favour of the primary assessment criteria, with the ETS driving *"levels of removals sufficient to help meet our climate change goals in the short to medium term*" and providing *"a sink for hard-to-abate emissions in the longer*

term" through *"a strong and stable price signal that would help drive more gross emissions reductions."*

25. We suggest that the objectives also need to consider fairness to investors, forest owners and land owners; and how to deal with low value or land-locked blocks which are often owned by Maori interests.

Chapter 5 consultation questions

5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why /why not?

The priority should be to meet our international obligations through the NDC target, which is net emissions, See also our detailed response above

5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow?

Yes, where cost-effective solutions exist. This is a patsy question.

5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard- to-abate emissions in the longer term? Why/why not?

This is another patsy question. Of course we do.

5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

See our detailed response to Chapter 6.

5.5 Are there any additional criteria or considerations that should be taken into account?

The true cost of options 3 and 4 need to be considered including the destruction of land and forest values, reduced afforestation, long term court cases paralysing proposed changes, and the risk of NZ not meeting its NDC commitments. Those societal costs may be unacceptable.

Chapter 6: Option identification and analysis

26. We noted earlier that the projections in Chapter 2 and later Chapters are based on superseded information. If the information on afforestation rates was updated, the concerns expressed in Chapter 6 over options 1 and 2, and the 'need' for options 3 and 4, might disappear. We could spend a lot of time and effort arguing the details of options that were in fact unnecessary.

27. We are also concerned that officials have not yet considered how to handle the differences between forests already registered in the ETS, and new forests being registered in the future. Should options 2, 3 and 4 prove to be necessary we would

like that issue resolved and included in a fresh consultation document. Clearly, the differences would be dependent on the option in question and since we doubt the analysis, and hence the options, we are unwilling to look at ways to handle those differences. Similarly, we are unwilling to investigate how 'the options' would impact on forests registered under stock-change accounting.

28. Given the Government has rejected a separate credit scheme for sequestration under He Waka Eke Noa we are surprised that it is considering Voluntary Carbon Markets in this document. Any scheme that monetises environmental benefits will be open to abuse; will require rules, monitoring and penalties to operate; and will demand a whole new flock of officials to run it. Voluntary Carbon Markets generally lack rigour and have been widely discredited overseas where they are often used for green-washing purposes. We see this idea as a significant risk.

29. We cannot understand why the Government is willing to consider purchasing *"between $3.3 billion and $23.7 billion in additional offshore mitigation to meet the 2021–30 NDC"* when it admits that domestic removals are cheaper. Why not simply plant some State forests and leave them out of the ETS? The carbon credits would help meet our NDC without disturbing the domestic market for NZUs, and we would save billions in foreign exchange. The forests could be strategically established in critical areas, and the money saved by the Government could be used to reduce the forestry stockpile. It doesn't really look difficult.

30. Of course the statements on pages 53 and 54 apply*: "It is not possible to predict with certainty, how private actors will respond to policy changes"* and *"Predicting the costs that each option will pose for the government is difficult".* But the costs to the economy including the value destruction of land or forests are not even mentioned in this assessment of 'options'.

31. Also not mentioned in the analysis of the options are the ecosystem services provided by exotic forests. They differ from the co-benefits of indigenous forests, but are significant in comparison to other land uses.

32. For all the reasons above, we oppose a radical approach as described in Options 3 or 4.

33. Given the uncertainty around the modelling we do not see any urgency on choosing between Options 1 and 2. However we suggest:

    - If there are to be controls on the amount of forestry in the ETS, annual limits could be imposed on the total forest area accepted into the scheme. The Commission believed that this would have a low regulatory cost and would provide flexibility for the Government to react to unforeseen events. Together with stronger controls on the volume of NZUs being auctioned, this might address most of the key issues in the consultation document.
    - The ability to "export" surplus NZUs would be useful, subject to suitable controls on both export volumes and the area of forests allowed into the ETS.
    - We also support the introduction of an expiry date on NZUs, provided that forest owners issued with units for forests under stock-change accounting should be able to hold them until they need to be surrendered.

Chapter 6 consultation questions

6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

See our detailed response above.

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

See our detailed response above.

6.3 Of the four options proposed which one do you prefer? Why?

See our detailed response above.

6.4 Are there any additional options that you believe the review should consider? Why?

Yes. See our point 33 above

6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

See our point 33 above.

6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?

Not qualified to say.

Chapter 7: Broader environmental outcomes and removal activities

34. New Zealand's environmental problems that have arisen from decades of abuse of our land, waterways and biodiversity. The problems persist as a result of deeply imbedded attitudes and economic models. The ETS is not a silver bullet for changing those attitudes or models, nor is it morally acceptable to use it as social window-dressing to distract from and delay changes to those attitudes and models. The Ministries concerned should face up to solving those problems with effective tools designed for the job, and let the ETS do what it was intended for.
35. Rewarding environmental activities through the ETS, like restoring wetlands, will obviously put more carbon credits into the 'removals' category and do nothing to reduce gross emissions. The main objective of this consultation is to "*prioritise gross emissions reductions while maintaining support for removals."* It does not include increasing the incentives for removals by widening eligibility.
36. We support all initiatives to remove atmospheric carbon, but we are concerned that they should not be rewarded with incentives until they are shown to be scientifically robust and cost-effective. Then they can be ethically promoted, carefully monitored and adequately regulated and it might be the time to suggest including them in the ETS.

Chapter 7 Consultation questions

7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

No. The prime focus of the ETS should be the net reduction of emissions. What is proposed would make the ETS significantly more complex and offer no benefit in terms of our NDC objectives.

7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?

We do not support widening the ETS at this time.

7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?

Not until they are shown to be scientifically robust and cost-effective.

7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals?

All mechanisms need to be rigorous and robust to avoid the risk of fraud. This makes them expensive to operate, and we are already worried about the proposed charging regime for the ETS.

I trust these comments provide useful feedback. Should you need it, the NZ Farm Forestry Association is willing to help in further considerations of climate change in relation to small scale forestry.

Neil Cullen
President, NZ Farm Forestry Association Inc.

Reviewing the Emissions Trading Scheme: Proposed Settings

Submitter: Kerry Worsnop

This submission is supplied in response to Government proposals concerning reforming the Emissions Trading Scheme: proposed settings, described in the discussion document.

I wish to make the following points:

There are clear benefits for society and the environment as a consequence of reducing air pollution, fossil fuel consumption and decoupling productivity from the oil industry. This is an admirable objective and something we all should strive to achieve.

There are opportunities for both Government and society to achieve widespread, and well received changes to our emissions profile as a nation, and in particular to achieve these objectives while simultaneously improving biodiversity, social wellbeing and our economic resilience to climate change.

The approach being adopted currently does not consider the environment as an ecosystem of the whole - consisting of terrestrial, aquatic, atmospheric and subsoil environs, interacting continuously with climatic, geological and human influences. This oversight currently ignores the capacity for these interactions to play a crucial role in our mitigation, defence and adaptation to climate change.

The allocation of units and their subsequent auctioning (free and 'earned') is a mechanism which directly considers only three of the possible influences – market demand (human influence), land availability and biomass (tree) accumulation above ground.

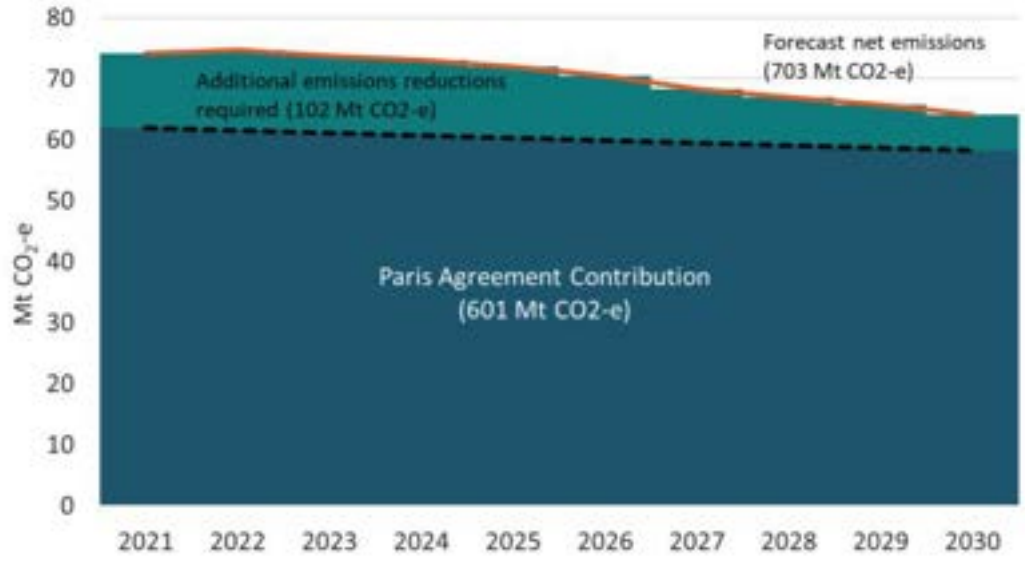
The Emissions Trading Scheme is both overly complex as a system, and overly simplistic in its interpretation of 'mitigation benefits'. This creates an artificial and yet lucrative market for both speculators and foresters which has no beneficial effect on New Zealand's ecological outcomes, economic activity or social wellbeing. It merely adds a process which will cost businesses in terms of administration and compliance, will cost society as a result of perverse afforestation incentives, and will heavily burden our landscapes with exotic and invasive species whose primary aim is to accumulate biomass, rather than to enrich the flora and fauna indigenous to Aotearoa.

A genuine desire to improve the resilience of the New Zealand environment and economy would require a focus on an 'ecosystem of the whole' in addition to gross emissions reductions targets, and sustainable planned regeneration programs sponsored by landowners and communities.

Gross emissions reduction targets were not mentioned at any point by policy makers until recently compelled to address this anomaly by the Climate Change Commission. The argument made to date has been that New Zealand plans to use the least cost means of attaining our Climate Change commitments, and to do this – afforestation would form the back bone of our approach. This argument failed to adequately recognize the dire consequences when offsetting predictably remained far more affordable for most emitters than actual emissions reductions. This therefore captured the market and will continue to do so until such time as the cost to substitute is approximately equal to the cost of offsetting. This would take decades under the status quo and would primarily be determined by the price of land.

The likely outcome of an ETS design which provides a guaranteed minimum price, and a corresponding stream of credits (of which the value is essentially underwritten by the NZ Government) is to promote a structural framework which locks businesses into a 'buy your licence to emit' culture. Once created

Figure 1: Forecast emissions and Paris Agreement Contribution emissions budget



Mt CO_2-e = million tonnes of carbon dioxide equivalent.

this default setting will take decades to undo and replace with a genuine 'seek efficiencies and lower emissions ' culture. This will occur for the following reasons:

- There are currently few (if any) barriers to offsetting using afforestation – we remain global outliers in this regard.
- The lowest cost option for participants in the ETS who accumulate liabilities will continue to be offsetting using afforestation until the carbon price reaches extreme levels.
- By this time the land price will have increased by an equivalent multiple, and behaviour change will only begin in earnest once land supplies at any price have dried up and no further 'offsetting' options remain.

The consequences of such a design scheme for the New Zealand economy should be obvious to anyone familiar with the relationship between forests, ports, roading infrastructure and the commodity cycles inherent in primary industries.

This risks an enormous redistribution of wealth across the New Zealand economy, and structural changes leaving New Zealand more reliant on a single product (logs) and a single market (china). If we assume the best-case scenario, whereby some alternative technology emerges which enables emitters to reduce their footprint organically, the natural reaction of the market should be a fall in price. The proposed price control prohibits this from occurring, therefore eliminating the natural risk (for foresters and speculators) associated with doing any kind of business.

Therefore, it is not possible for a reasoned person to accept the status quo as anything other than destructive, and short sighted.

In a global market which is deeply risky and offering sluggish (in some cases negative) returns, such a guaranteed scheme has attracted immediate attention and large-scale investment far beyond what the Government publicly indicated it would support. The fact that forest investment has ground to a near standstill since the announcement of a review stands to highlight just how completely the carbon dynamic has captured the forest industry and how little sustainable (market oriented) interest there

is in further afforestation investment in the absence of carbon. This should sound alarm bells given that it is these markets which presumably support our nation beyond 2050 or when the carbon price is no longer required.

In the absence of any significant controls in this space, the result will likely be a continued significant draining of the New Zealand economy and subsequent inability to afford the mitigation measures required to future proof our infrastructure, communities and environment in coming decades.

There is an urgent need to review the ETS as a mechanism for lowering emissions, to reform its purpose to prioritise real and sustained reductions in emissions and to provide due regard for the likely outcomes of creating a fast track emissions 'currency' which will be minted solely in the provinces, at the expense of current land uses, economic diversity and ecological integrity.

Recommendations

-Decouple the carbon price (units surrendered) from the sequestration price (units earned) as the current connection prevents the carbon price rising without massive land-use ramifications on all classes of land at prices over $80 per T.

- Limit the amount of offsets than can be surrendered to a very low figure (no more than ten percent) – or limit these offsets to 'insets' where changes deployed within an operation can be eligible for their own units, thereby returning the focus with what is within a company or individual's control.

-Consider whether further (from the date of adoption of the ETS amendments) NZ units should be created and held by the NZ Government (as they were originally intended to be) and only released in a controlled manor which aligns with the 'whole of ecosystem' concept, prevents indiscriminate afforestation and limits the degree to which the forest industry would come to depend on carbon as its primary income stream.

This would provide funding for the following beneficial effects:

- Forests with good management techniques, producing high quality lumber would maintain a focus on timber quantity and quality as the primary source of their income.
- The incentive to 'plant and leave' exotic (production) forests could be limited
- The inefficiencies which rapidly develop in any subsidised industry could be avoided and undesirable behaviour minimised
- Foreign investment into productive enterprises (rather than accounting ones) would be supported.
- A higher carbon price could then be decoupled from the price of land and limit the extent to which industry would consider 'offsetting' as its default source of mitigation – thereby encouraging faster innovation and a clearer pathway to reductions in actual emissions.

International considerations:

The Climate Change Commission has recently called into question the validity of our current approach to offsetting emissions in the context of Sustainable Development Goals. There is mounting evidence that the power struggles which are the natural result of driving up demand for land, unfairly disadvantage individuals, farmers and communities in favour of larger corporate or international interests who are better able to compete for the increasingly scarce land resource.

A recent report by the World Resources Institute highlights the folly of incentivising demand for timber as biological store for carbon, for bioenergy or for biofuel, due to the externality this then creates internationally. The interlinked nature of the global marketplace means that domestic decisions have global consequences and far more so for net exporting nations such as New Zealand.

The report introduction notes,

" Governments, companies, organizations and people everywhere must start by understanding that every hectare of productive land is valuable, whether for producing food or wood or storing carbon and supporting biodiversity. Every hectare of land used to supply human consumption comes with a high "carbon opportunity cost." Despite this inherent cost, some government policies are deliberately increasing demand for land by creating incentives to harvest more trees or grow crops for bioenergy. These policies could more than double the demands people place on land, destroying habitats and releasing vast stores of carbon into the air.

We need a systems approach that stops treating land as "free" and successfully evaluates how the burdens of meeting human needs might be transferred from one place to another. In short, we need an approach that recognizes how land may be our most limited resource."

The international recognition with regards to the planetary limits of offsetting is also worth considering, given that Oxfam highlights that there is not enough land on earth to sustain the offsetting goals currently being pursued. The ramifications for food production under a more trying climate and a growing global population have attracted attention from the likes of the UN, the World Bank and the many Governments who are currently implementing food security provisions in order to ensure their economic and nutritional independence.

Offsetting as a concept is rapidly being rejected by the world that we often proport to 'lead' environmentally and socially. This is inconsistent and cynical.

The treatment of Maori land

There are real concerns and genuine challenges facing many Moai landholdings, and it is understandable that a windfall the size of the ETS would be strongly welcome by Mari participants in the ETS. My question is how well do the whanau and hapu understand the stance being advocated on their behalf by some leadership? How many ordinary maori actually want their land in pine? On the East Coast and wider Tairawhiti, it would be very few. A better question might be how many people simply want to see solutions offered to the underlying challenges that have left the land unable to access capital and often fragmented and difficult to administer? These challenges themselves need to be addressed, simply plastering the land in trees and paying out one generation is not going to resolve the land's ability to provide for the people who connect to it long into the future.

It concerns me that many communities won't realise until its too late that being the only ones able to claim credits for permanent exotics (which is advocated for in some quarters) simply means you will be the only ones with no land left in 50 years. It's not a blessing anyone's grandchildren will thank them for, after all, guns and blankets probably sounded great once upon a time, but 100 years later, such a price seems absurd. I wonder if the surrendering of land (even remote land) under a permanent carbon liability today will one day seem as absurd as selling land for guns and blankets.

Question 2.3

In response to the question around forester behaviour – the response to the initial instruction of ETS settings three years ago – there was an immediate response by some forestry companies. One

contractor I spoke with at the time (he drove a digger) told me his whole crew was sent home and told the forest was being 'retired'. That company went on to designate their entire production forest estate a 'carbon only' forest.

Another example is the purchase or HoreHore station under Mount Hikurangi on the East Coast. Mt Hikurangi (the sacred mountain of Ngati Porou) currently sits over a 1600 hectare farm which has been purchased by a Ngapuhi affiliated corporation and planted in radiata which can never be harvested or 'transitioned' because it has no road access. It's highly unlikely that Ngati Porou feel that Ngapuhi has the best interests of the land at heart when they purchased and planted this farm. Like many others, the calibre of the individuals and their relationship with the land is a far better determinant of good outcomes than a blanket assumption that 'all maori will make good decision for the land' and therefore need no rules.

I would highlight that the sheer amount of money involved is inducing exactly the wrong trees in the wrong places, and this is happening on all classes of land.

The last example that I would give is that those investing in carbon forests and claiming to transition them clearly believe that the ETS as a mechanism will not work. This assumption is based on their idea that revenue from the ETS will still be sufficient decades from now (between 50 and 80 years even) to fund highly costly transitions. If there remains a one to one relationship between polluting and 'planting' then this will very likely be the case.

Conclusions

I support option 4.

I agree that we need to limit offsetting and focus on gross emissions. If less funding was being funnelled into afforestation, then auctions would leave the Government with far greater scope to incentivise real changes rather than superficial ones based on accounting principles and removed from our social and ecological reality.

Finally, the proposals relating to carbon markets and their administration are ultimately reliant on the supply of land currently supporting the main mechanism of providing credits (forests). It therefore critical that the impact of implementing any system take full account of how the broader mechanism will impact land users, their families and the economy at a regional level who depend on them.

It is not possible to achieve a 'just transition' when the burden of the nation's emissions reduction targets will be forced upon rural and provincial New Zealand with no regard for the social and economic and environmental harm this mechanism will wreak.

For these reasons this submission is intended to highlight concerns not only about the proposed setting and the outcomes they seek to achieve, but about the ETS itself as a mechanism for effecting change.

Thank you for the opportunity to submit. Please consider these recommendations and feel free to get in touch should you have any questions.

Sincerely Kerry Worsnop

Using an auctioned licencing scheme to give transparency, stability and confidence in the quantity of forestry in the ETS.

Submission to the Review of the New Zealand Emissions Trading Scheme

[redacted]

August 2023

A) Executive Summary

The Government needs to have the ability to utilise the ETS to both reduce gross carbon emissions and encourage sustainable forest carbon sequestration.

Our timeline to reduce CO_2 emissions is short. The ETS can deliver the desired outcomes, but the Government needs to have more control over the price of NZU's and this cannot be achieved unless it has control over the supply of exotic forestry NZU's entering the ETS.

This submission advocates that the Government continues to use its existing annual settings used to regulate NZU supply and include an additional lever to effectively control the supply of Exotic Forestry NZU's into the ETS.

The additional setting will stipulate the maximum number of new hectares of exotic forestry which is eligible to be registered in the ETS in the specified years.

An equitable method of allocating the annual hectares to be grown would be an Ascending price auction scheme like what **Zespri successfully utilises to control the annual allocation of licences to growers for its varieties.**

An adaptation of the Zespri licencing system by the Government will increase control over:

a) The amount of exotic forestry entering the ETS each year.
b) NZU Price through having increased control of the levers affecting supply and demand.
c) Messaging to the market and the forest industry giving them some more certainty on which they can base long term Investment decisions.
d) The ability to pre-approve the areas to ensure right trees go in the right places as opposed to the current system of registration post planting.
e) The allocation of licences between the schemes, land classes, regions and to Māori.
f) The proceeds from the licencing fees could be targeted towards incentives for further indigenous forest plantings.

Our recommendation utilises a proven licencing auction system - used in NZ today – to provide the Government control over the supply of exotic forestry-sourced NZUs into the ETS, thus helping to keep upward pressure on the ETS price, whilst providing clarity to foresters about the near-term role for forestry in the ETS. This balances the competing objectives of needing aggressive short-term reductions in NZ's net emissions, stabilising the price signals for gross emissions reductions, and providing clear investment signals to the forestry sector. The settings for our proposal fit well with the current ETS market settings (e.g., industrial allocation, and price and unit controls) and thus do not represent a material departure from historical policy around the ETS.

B) Key issues to be addressed.

"The era of global warming has ended; the era of global boiling has arrived." (UN Secretary General 27/7/2023)

"Our task with this review is to determine whether to change the NZ ETS to drive and maintain the price of carbon that is needed to reduce emissions, and if so how, while acknowledging that forests remain an important part of the overall picture." (Hon James Shaw, Minister of Climate Change)

"The NZ ETS, in its current form, may not be leading to the best outcomes for all New Zealanders. The NZ ETS is likely to continue to encourage high levels of exotic forest to be planted but might not encourage gross emissions reductions or indigenous afforestation." (Hon Peeni Henare, Minister of Forestry)

The key points to focus on that come out of these quotes that need to be addressed are:

a) Our timeline to reduce our greenhouse gas emissions (72% CO_2) is very short, if we are to have any chance of meeting our Paris commitments (50% reduction by 2030) and limiting post-industrial warming to less than 2 degrees.
b) NZ ETS is our primary mechanism for incentivising the reduction of CO_2 and it is proven to work so long as a sufficiently high NZU price is maintained.
c) Upward pressure on the ETS price requires there to be a relative scarcity of the supply of NZUs relative to the demand for NZUs.
d) While the government is gradually restricting the supply of NZUs through the emissions budgets, high levels of exotic forest continuing to be entered into the ETS could cause an oversupply of NZU's which will likely lead to a low NZU price.
e) Encouraging Indigenous afforestation is included by some parties as a goal of the ETS.

   New Zealand has around 8 million hectares of indigenous forest that evolved in isolation over millions of years. It does an incredible job in carbon sequestration as well as having important co-benefits such as biodiversity. How-ever in terms of carbon removal, exotics compared to indigenous forests are significantly more efficient both in terms of lower cost of establishment and carbon sequestration. Figure 1 below is a simple model that highlights the difference, which in this example in terms of (Cost of establishment ÷ CO_2 Removed) shows Pines have a 32:1 advantage.

Figure 1

Est Cost v Carbon Sequestation 25 Yrs	**Pines**	**Indigenous**
Establishment Cost per ha (Indigenous range $15-$30k/ha)	**$ 3,000**	**$ 22,500**
CO_2 Sequested per ha by Yr 25 (source ETS-supply-modelling-based-on-CCC-ETS-price-	**828**	**195**
$/t Carbon Removal	**$ 3.6**	**$ 115.6**
Ratio Diff	**32:1**	

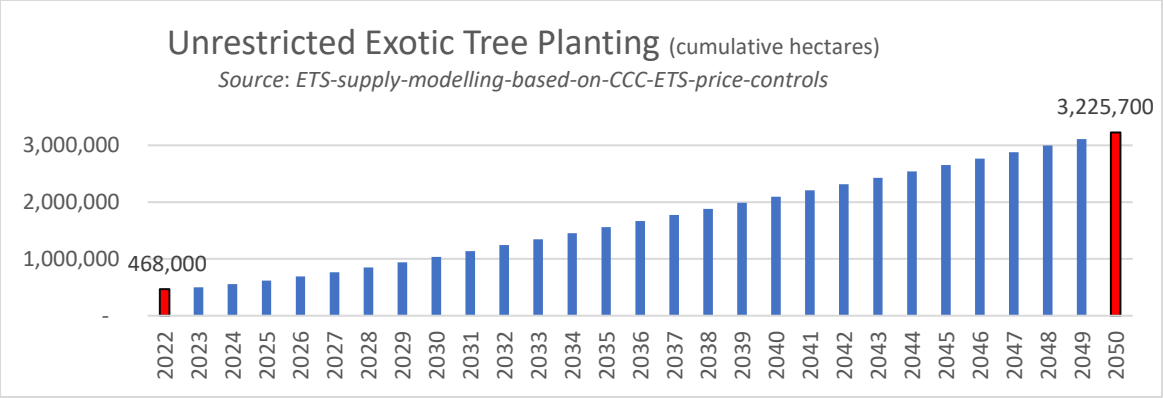
The ETS needs to be laser focused on reducing gross and net emissions in a **short** timeframe. Exotic afforestation is our best tool for carbon removal, and this can be achieved through increased control around the supply of NZU's into the ETS while ensuring the right tree is in the right place.

C) The ETS problems that need to be solved and the goals that need to be achieved.

The current ETS settings around Exotic Forestry are not fit for purpose due to the following factors:

1) Unrestricted Supply - NZ has a large supply of land that could go into exotic forest and with an increase in the price of NZU's the financial returns of carbon forestry could outweigh other land uses returns. The possible conversion of land to exotic forestry is demonstrated by the CCC modelling in figure 2, with 468,000 ha registered in 2022 forecast to rise to 3,225,700 ha by 2050.

Figure 2



2) Excess supply of exotic forestry NZU removals will lead to lower prices which will discourage carbon polluters from reducing their gross emissions.
3) If left unchecked and without regulatory oversight, large-scale land-use changes to permanent exotic carbon forests may have unintended impacts on the environment and rural economies.
4) Current rules and guidelines around exotic forest are insufficient and do not ensure that the right tree is planted in the right place.
5) The Government finds it difficult to forecast and set policy to achieve the ETS goals given the lack of control around NZU supply which leads to market volatility.

Goals for the ETS (as outlined in the discussion document):

6) Ensure that those responsible for environmental damage pay to cover the cost and incentivise them to significantly reduce gross emissions.
7) Help NZ transition to clean energy.
8) Incentivise native and exotic forests, sequestering carbon.
9) In the future, reward biodiversity and wetland restoration, among other benefits.

Other factors that need to be considered:

10) Māori aspirations for guardianship and self-determination of whenua and taonga need to be considered in the NZ ETS review.
11) Better support for indigenous afforestation and regeneration is needed.
12) Existing rights of exotic forests which entered in good faith into the ETS on a long-term basis need to be honoured. A retrospective change in the rules would be a breach of trust, harm New Zealand's international reputation, and lead to a lack of confidence around future investment based on Government policy.
13) The industry surrounding exotic forestry including nurseries, planters and landowners need clear signals of areas to plant e.g., nurseries order seed 2 years in advance of planting.
14) Pinus Radiata has attracted a lot of publicity from several interest groups and the public. The facts need to be established by independents so NZ can take advantage of the positives and mitigate the negatives.
15) Earth is on the brink of several disastrous climate tipping points; CO_2 reduction is critical. The process, actions and resolutions that come out of this review needs to match that urgency.

D) A Solution

Our solution is based around Option 1 of the Discussion Document:

Use existing levers to strengthen incentives for net emissions reductions.

However, to re-solve issues that have been identified around Exotic Forestry within the ETS and to meet the Goals outlined above it will require an additional setting.

The existing process that is in place for regulating the supply settings in the NZ ETS which are updated annually include the following settings:

1. the number of units for release at auction
2. the number of units for release if the cost containment reserve is triggered.
3. the level of the cost containment reserve trigger price
4. the auction reserve price.

This is an established process that can be effective in putting a price on carbon emissions, this price needs to increase over time to encourage Gross Carbon Emissions reduction, commensurate with the Climate Change Commission's Demonstration Path.

However, an unregulated over supply of Exotic Forestry NZU's into the ETS will supress the NZU price which will discourage carbon emitters from reducing Gross Emissions and making the ETS ineffective in meeting its goals.

Under this proposal a fifth annual setting would be added:

5. **the maximum number of new hectares of exotic forestry which is eligible to be registered in the ETS in the specified years.**

E) How the new setting can be implemented.

The 5th setting is designed to control the supply of forestry units into the ETS. The method by which this could be done could be through an adaptation of the Zespri licencing system.

Zespri controls the allocation of the number of hectares of its different varieties that are planted each year by allocating licences to potential growers bidding for the areas in an **ascending price auction system**.

Historically Zespri released its licences to plant and grow its new cultivars by a bid tendering system but changed to an ascending price open auction this year (2023) to provide greater price transparency and meant all growers paid the same licence price. This year two auctions were run for a total of 348 ha with successful bidders paying an average of $687,000 per hectare raising $239m revenue for Zespri.

A similar licencing system could be used in the ETS which would govern the process and rules for allocation of licences to grow pre-determined areas of Exotic Forest which would be eligible to enter the NZ ETS.

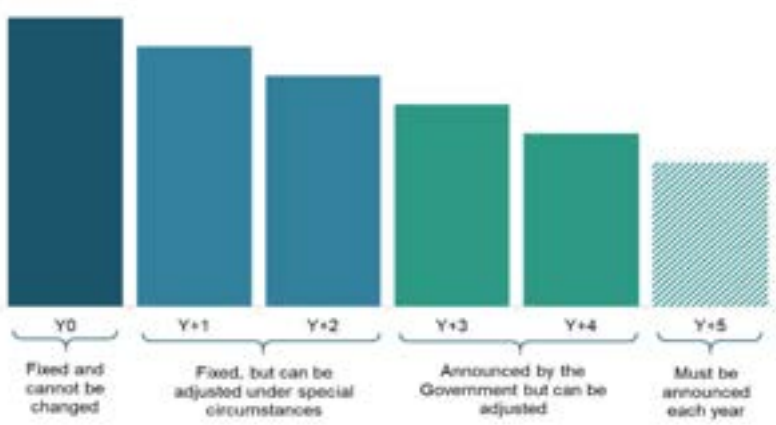
Key features of the process.

1. The Government would control the process by making available licences to be admitted to the ETS for a pre-determined number of hectares, thereby controlling the supply of exotic forest NZU's.
2. Owners of exotic forests (excludes foreign owners) would apply to become eligible forest for the auction process outlined below. Exotic forests that have already been admitted or waiting (including areas planted that are committed to be planted in 2023 and 2024) to be entered into the ETS would have their existing rights under the scheme honoured through an automatic granting of a licence. A starting point for this system could be the 2025 planting season.
3. Licences for new areas will be allocated by way of an independently operated online ascending price auction process.
4. Bids will be on an dollars per effective (fully defined) hectare basis.
5. Auction proceeds will go to the Government and could be used to fund Indigenous Forest initiatives.
6. The licence allocation process would consist of two stages:
    i) an application and pre-approval process, to determine eligible forests; and

ii) an online ascending price auction operated by an independent third party that will be open to pre-approved participants.

7. Eligible participants would supply in advance (e.g., minimum 4 months) an application which would include information like that currently supplied to MPI under the ETS registration process. Major difference being areas will be intending to plant rather than actual planted area.
8. Areas available for auction could be provided to the market on a 3-5 year rolling basis. Any changes to these areas would have to fall under the same limits on the Minister's discretion as outlined for unit limits and price controls in the Climate Change Response Act 2002 (Figure 3). Accompanying the announcement would be updated forecasts on the supply of ETS NZU's which would give the NZU market more certainty around the supply.

Figure 3



9. Licences to individual participants would be subject to a minimum (e.g., 10 ha) and maximum (e.g., 2,000 ha) allocation with strict conditions and penalties around related parties with high levels of common ownership not being able to circumvent the system to exceed the maximum area allowed.
10. To avoid speculative trading of Licences there could be a restriction on transfer of licences within a set period after planting (e.g., 2 years).
11. Different licence allocations and individual auctions could be held, e.g.:
    i) Accounting Scheme and Permanent Scheme
    ii) Māori interests could have a separate allocation and auction – e.g. Have a greater allocation of Permanent Scheme licences for Māori.
    iii) individual/grouped exotic species – Help spread species disease risk, time to maturity and allocation of NZU's.
    iv) Regions (e.g., North and South Island) – Help to spread geographical climatic and disease risk.
12. All successful Auction participants will be required to pay:
    i) A deposit (e.g., 25% of the final licence auction price).
    ii) The balance would be paid before the issue of licence (e.g., 2 months after the auction date)
13. Auction participants can participate online and live during the Auction rounds or may submit "Pre-set Bid" instructions in advance with maximum bid price(s) specified for the area sought, which will then operate automatically during the Auction process.
14. Successful auction participants would be required to plant to at least MPI's minimum standards within a set time (e.g., 2 years from allocation of the licence).

15. Successful auction participants who are unable to plant to MPI's criteria either part of or the total area could apply in writing for a partial refund. Any refund would be at MPI's sole discretion and consider market movements since the auction.
16. Right tree in right place – Through the pre-approval process the Government will have more control through strict criteria around the following:
    i) Meeting the new National Environmental Standards for Plantation Forestry.
    ii) Rules around land class to be planted (restricting productive farmland being planted)
    iii) Class and area of land that can be entered into each scheme.

Please refer to appendix 1 for an explanation and example of how the ascending auction process could function.

F) How does this licencing system resolve the ETS's current issues.

Current Settings not fit for purpose:

Existing Issue	**Licencing System effect**
Unrestricted supply of Exotic Forestry NZU's causing oversupply and supressing the NZU price.	EPA will have control over the annual allocation of Exotic Forestry area into the ETS.
Difficult to forecast and set policy to achieve ETS goals due to lack of control of ETS Supply	EPA already controls the ETS auctions and free allocation to Industries. This added lever gives control over Exotic Forest NZU's which gives the Government and Markets more certainty around forecast models reducing price volatility.
Current rules don't ensure right tree is in right place.	The pre-approval process will give the opportunity to vet and approve or decline areas prior to planting as opposed to current system of approving post planting.
Large scale land use change to exotic forests having negative effect on environment and rural economies	Land use change and its effect can be one of the measures used during the pre-approval process.

Goals to be met and other factors that need considered:

Goals and other factors	**Licencing System effect**
Those responsible for environmental damage cover the cost and incentivises them to reduce emissions.	Increased control over supply will give Government the necessary levers to increase the NZU price which will encourage the reduction of gross emissions.
Help NZ to transition to clean energy	Higher and more stable NZU price = increased incentive to switch to clean energy.
Incentivise exotic forests to sequester carbon	While controlling the hectares that enter the ETS it does not preclude the Government introducing other incentives/schemes for exotic forest.
Incentivise indigenous forests and reward biodiversity.	Indigenous forests are exempt from this licencing auction system. There is low risk in them causing an oversupply of NZU's. An option is for proceeds from the Exotic licencing system to be targeted towards further incentives for Indigenous planting.

Goals and other factors (continued)	**Licencing System effect** (continued)
Have a system that is fair to Māori.	Māori's licenced allocations can be treated separately, and allocations could allow a higher level of permanent forest area compared to the regular pool.
Existing rights of exotic forests entered into the ETS in good faith need to be honoured.	The issue of potential future over supply of NZU's based around future supply not the current rate of Exotic Forest which in 2022 is 14% of the projected unrestricted hectares by 2050.
Clear signals given to the forestry industry of areas to plant.	The EPA will signal 3-5 years in advance of planting its Exotic Forestry hectare allocations and give the industry some stability (e.g., nurseries order seed 2 years in advance of planting)
Carbon removals are required in the short term.	Pinus Radiata have a superpower: It grows fast and sequesters significant volumes of CO_2 while it's still young. This needs to be harnessed by the EPA and used to meet the EPS 2030 and 2050 targets. A licencing system would provide the opportunity to vary the rate of planting as the market and wider situation demands (e.g., higher planting rates over the next 5 years)
Urgent action is required from this review.	This licencing system adds a further setting into an existing framework and causes significantly less ETS structural change than the other options outlined in the review. Signalling the Exotic forestry NZU's that are required by the ETS well in advance gives the Government more control over supply and exotic forestry stakeholders a more stable base on which they can work from.

Appendix 1 - The Auction process: (this example assumes the Environmental Protection Agency (EPA) manages the overall process)

(a) **The Auction will take place over successive rounds.** There will be intervals between the first and each subsequent round. A calendar showing the dates and times of all Auction rounds would be made available to the participants by the EPA in advance.

(b**) In the first round, a starting per hectare price which will be pre-determined by EPA at its sole discretion will be stated** (this will normally be a conservative price).

c) **In the first round each Auction participant must then enter the number of hectares (up to but not more than their maximum permitted pre-approved area) that they wish to bid for at the stated price.** If an Auction participant makes no bid prior to a round closing, then that participant exits the Auction permanently.

(d) **After the close of the first and each subsequent round, Auction participants will receive confirmation of the results, via the online Auction facility.** Each Auction participant will be the only person able to access and view the results for their own bid(s), however the total number of hectares bid for in each round will be disclosed to all participants after each round to help inform the market throughout the process.

(e) **Once a round is closed, if there are bids for a total area exceeding the Total Available Area, then the Auction will move to a subsequent round.** In the subsequent round, EPA will, at its sole discretion, set a higher per hectare price than that set in the previous round. All remaining Auction participants (other than Pre-set Bidders) must once again enter the number of hectares (and not more than bid for in the previous round) the new price.

(f) **If, at the conclusion of the first round, the total area bid for is below the Total Available Area, then the Auction process will conclude with Licences being allocated to those who bid, for the price set for that round for the area bid by each Auction participant, and with the remaining unallocated licence area being passed in (which shall not be re-offered under this, or any other process).**

(g) **If the total area bid for at the conclusion of any round is equal to or within 95-105% or 2,000 hectares** (using an example) **of the Total Available Area (whichever is less), then the EPA may determine that the Auction is concluded, and allocate Licences to all Auction participants in that round for the price set for that round, for the area bid by each Auction participant.**

h) **Any under allocation of the Total Available Area in the final round will be passed in and shall not be re-offered under this or any other process.** To any extent that the Total Available Area is over-allocated in the final round, MOE shall issue such additional Licence area as is required to satisfy all bids.

(i) **Any Auction participant may provide fixed bidding instructions ("Pre-set Bid") prior to the commencement of the Auction.** In making a Pre-set Bid, that Auction participant must specify at what price points their bid area will reduce, eventually down to zero. These pre-set bid instructions will be acted on and monitored by an independent party to the EPA.

Worked example of the auction process:

Round Number	Round ($/ha)	Total Avail Ha	Total Bid Ha	Oversubscribed by (Ha)	Auction Completed	Time Next Update
1	$ 2,000	50,000	152,000	102,000	No	10:30am
2	$ 2,400	50,000	137,000	87,000	No	11:00am
3	$ 2,750	50,000	124,000	74,000	No	11:30am
4	$ 3,150	50,000	112,000	62,000	No	12:00am
5	$ 3,625	50,000	98,000	48,000	No	12:30am
6	$ 4,175	50,000	84,500	34,500	No	1:00pm
7	$ 4,600	50,000	78,750	28,750	No	1:30pm
8	$ 5,050	50,000	63,800	13,800	No	2:00pm
9	$ 5,550	50,000	56,050	6,050	No	2:30pm
Final	$ 5,825	50,000	50,800	-	Yes	N/A

Clare Robinson
[redacted]

Email to: etsconsultation@mfe.govt.nz by 11.59pm Friday 11 August 2023

Submission on NZ Emissions Trading Scheme Review and Permanent Forest Category Rules

I am a resident and tangata whenua of the East coast area and also a member of Mana Taiao Tairāwhiti, a group of residents in Tairāwhiti concerned about the ecological and economic impacts of land use in the region.

(1) ETS Review

What is the current NZ ETS going to do to emissions reductions and removals?

The ETS is a key piece of NZ's climate policy architecture intended to support the reduction of greenhouse gas emissions. However as it currently exists, the NZ ETS operates as a system for offsetting fossil fuel emissions with commercial pine plantations. It does not effectively reduce emissions or encourage truly permanent biodiverse forests. It needs to change.

Does the NZ ETS need to be able to drive emissions removals from activities like forestry?

There are real opportunities to support farmers to manage their current indigenous cover, and establish new forests in ways that can increase carbon removals. This can be done both in, and outside of, the NZ ETS.

It is important that the Government clearly defines the role of both forestry and exotic tree plantations within New Zealand and especially in tools like the NZ ETS. We are concerned with the current scale and pace of land use change and the impact this is having on rural communities and landscapes.

. A natural forest contains a much broader range of tree species. Plantations may also include trees that would not naturally exist in the area.

If emissions reductions are to be prioritised in the NZ ETS, how could the scheme be changed to achieve this?

The need to provide stronger incentives to motivate emissions reductions alongside making it harder to offset. These incentives should not come at the expense of rural communities through the blanket planting of exotic permanent forests.

Slower-growing indigenous forests may not provide the quick hit of carbon removals that pine does, but they will continue to remove CO2 over a long time horizon than pine.

A significant part of NZ's contribution to warming is a result of deforestation since 1850. We can bring ourselves back into balance with the atmosphere, as well as within our domestic ecosystems by restoring native forests that should never have been cut down. The Climate Change Commission has shown that current warming from agricultural emissions is greater than warming from all fossil fuels we've ever emitted.

If NZ acts now to establish this long-term carbon sink, it will be in place when we need it from 2050. Native forests take decades to reach peak growth, so we need to be putting them in the ground now. If we do, we will avoid the position we're in now of needing to pay other countries to help meet our future international targets. We should use the funds required to meet this liability to enhance the quality of existing native forest and reestablish new indigenous forest on marginal, low productivity farmland.

If we do not establish this long-term sink, we are relying on technologies that don't exist or are currently far from viable, and reliant on them being available at massive scale. It is prudent to take the low-cost option that we have in front of us.

Establishing a long-term carbon sink is a strategic investment that sets NZ up for the rest of the century, as well as putting right our own balance with the atmosphere and restoring local ecosystems. There is little risk, as high-quality carbon removals will have long-term international value: many other countries do not have NZ's potential to reforest. It also protects our future food production. There is therefore a strong case for the NZ government to help create this resource for the future.

The consultation document refers to a "carbon removal strategy" being developed by the government. This must consider the long-term need for net-negative emissions as a key driver of support for forestry.

The consultation document shows a falling ETS price under status quo. An objective could be for forestry to receive stable support for carbon removals better than these status quo levels (i.e. rising rather than falling).

The Minister's introduction states "We need the NZ ETS to incentivise both emissions reductions and carbon removals from forestry". However the ETS cannot do both of these things on its own. We are reaching a point, as explained in the consultation document, where ETS emitters will not provide sufficient demand for the forestry units being created. The establishment of a long-term forest sink should not be dictated by the speed of gross reductions, and the rate of gross reductions should not be slowed by the presence of forestry. Decisions on these need to be able to be made independently, so that both can be achieved.

It is in this light, assuming the goal is to drive both gross reductions and indigenous reforestation as rapidly as possible, that we consider the options presented in the consultation document.

We agree with the summary of impacts of exotic afforestation. While "right tree in right place" is important (wood, biofuels in a low carbon economy etc), we see indigenous reforestation as the key to providing a long-term durable carbon sink, avoiding adverse effects of exotic afforestation.

Do you agree with the description of the different interests Māori have in the NZ ETS review?

"We have heard that the NZ ETS, particularly the permanent forest category, presents a significant opportunity for economic development" - there has been a concerted campaign of lobbying by a handful of Māori involved in the carbon farming industry to prevent even a discussion about the NZ ETS policy settings, we suspect they have been resourced by much wider carbon trading interests. This group, most recently fronted by one or two individuals associated with an organisation called Te Taumata, has presented no credible evidence to back up claims of billions of potential losses for Māori entities if removals via pine are limited in any significant way. Government policy created the NZ ETS and the associated market in carbon units for a particular purpose and it is not achieving that purpose, it is also having unintended consequences with significant negative social, cultural, environmental and economic impacts. The Government has a duty to fix the NZ ETS before it causes even more damage. Meanwhile surveys of Māori landowners (as provided in submissions on the Permanent Forest Category in 2022) show near unanimous consensus for prioritising indigenous afforestation and rapidly reducing pine plantations on whenua Māori.

In many government documents, including the current NZ ETS review document, part of the reasoning for the Māori commercial interest in exotic forestry has been given as follows:

"Around 30 per cent of Aotearoa New Zealand's 1.7 million hectares of plantation forestry is estimated to be on Māori land. This is expected to grow to 40 per cent as Tiriti settlements are completed."

However a recent OIA request to Te Uru Rākau, the New Zealand Forest Service, resulted in provisions of a dataset showing that post-1989 planted forests on Māori land, that is the forests relevant to the ETS settings, is 47,408 hectares and pre-1989 plantation forests on Māori land make up 153,233ha. Even combined that makes up only 11.8% rather than 30%. Where does the 30% statistic come from as no report is ever cited.

Further, Māori are not a homogeneous group and many of us strongly support limiting removals credits to only indigenous forests (for example: https://manataiao.wordpress.com/recloaking-papatuanuku/).

Forestry is certainly an important component of the "Māori Economy", but commercial timber industries should be profitable in their own right, without earning carbon credits and the opportunities of carbon farming with indigenous forests is still there even on marginal land. Currently this is not feasible, in part, due to the downward price pressure of the cheaper P*inus Radiata* monocrop plantations that the Government has allowed into the Permanent Forest category for some bizarre reason.

A recent memorandum submitted by a Māori land trust in Tairāwhiti to the Waitangi Tribunal in support of the WAI2607 claim lays out the concerns and claim of Te Tīriti breaches this way:

(a) The overreliance on planting pine forests to offset Aotearoa's emissions, which is likely to mean carbon prices remain low for emitters so pollution rates remain high and forest owners don't make the money they expected to, resulting in abandoned forests.

(b) The resulting effect on the environment from production forests - such as the slash currently running down rivers and associated soil erosion after clear-felling plantations – and also from permanent plantations of pines with the subsequent cost to the restoration of indigenous taonga that Māori have kaitiaki responsibilities for and Te Tīriti rights to the protection of.

(c) The failure of policy instruments like the Emissions Trading Scheme to better record the value of diverse indigenous forest and incentivise the planting and regeneration of native forests as an offset which would also be better for the environment.

(d) Failure to support Māori communities in Tairāwhiti and elsewhere in adapting to the effects of climate change, that Indigenous peoples are suffering greater loss from sooner and more significantly than the general population.

(e) Failure of the Government to provide support for the development of equitable and just transition plans and processes to support a rapid emissions reduction and economic development based on circular and regenerative local economies rather than extractive, unsustainable industries.

(f) General failure of Government policies in reducing Aotearoa's emissions.

What other interests do you think are important? What has been missed?

The interests of indigenous flora and fauna, taonga species and microorganisms seem to be missing from most of the consultation considerations. Endemic organisms have a right to exist here and public policy should take account of impacts on the environment, particularly indigenous organisms, whenua conservation, te mana o te wai and te mana o te moana. Policies should not exist that incentivise exotic monocrops including pine and pasture to be maintained or expand at the expense of reestablishing taonga on the whenua. Māori have a Treaty right and responsibility as kaitiaki to protect, preserve and provide for taonga species that have been excluded from the whenua by successive Crown policies.

"the Government also recognises that the NZ ETS review could disadvantage future generations, particularly through options that may limit forestry opportunities. As well as being essential to our climate response, forestry is an important source of income and livelihood for Māori. Limiting economic opportunities in the short term may leave future generations less able to respond to climate change and to realise wider social, economic and cultural aspirations."

This is an illogical argument. It is far more risky for Māori to allow short-lived monocrop species that grow fast but are not required to have carbon income set aside for the promised but not evidenced transition from pine plantation to diverse native forest - that process will be expensive and likely result in a significant liability if carbon sequestered in plantations is not immediately replaced in

slower-growing indigenous forest. Future generations are likely to be burdened with massive costs and a wrecked landscape littered in invasive pine that continues to replicate itself.

How should these interests be balanced against one another or prioritised, or both?

The interests of indigenous species need to be prioritised in this policy. Policy addressing the climate crisis should take into account the biodiversity crisis and not exacerbate or extend the biodiversity crisis. The interests of future generations should be prioritised so that they have a long-term truly sustainable carbon buffer via diverse, healthy indigenous forests that started growing in the 2020s, not the 2050s or later.

What opportunities for Māori do you see in the ETS review? If any, how could these be realised?

The opportunity exists for Māori (and taonga tukuiho) to have policy that provides strong incentives instead of strong disincentives for the reforestation of whenua Māori and General title land in indigenous ngahere that will store more carbon much longer than short-lived, shallow-rooting exotic monocrops like Pinus radiata.

(2) Permanent Forest Rules

Our recommendations for the Permanent Forests Category:

- Don't allow 'transition forests' to be approved until there is (a) sufficient science showing how to successfully manage the transition from a pine plantation to a diverse indigenous forest; (b) clear costings for that process, if it can be done, specific to each context (especially hard to reach, erosion-prone East Coast land); and (c) sufficient funds set aside from any carbon income (a minimum of 50% of carbon income) to pay for the costs of transition.
- Although the proposals included in the permanent forest sink initiative consultation will go some way, it is important to progress additional management of the wider effects associated with large scale land-use change, particularly if concentrated in certain communities.
- Permanent exotic forests need to face tighter restrictions and management plans that reflect the associated risks (for example wildfires, pest management, and wilding pines).
- Some exotic forests could be included in the category if there are strong conditions on entry which restrict the species, location, and scale of planting. Examples include only allowing exotics if they are deep rooting, longer-lived species in smaller areas of planting. Recent research by Manaaki Whenua Landcare Research (Marden, M., 2002, McMillan, A., 2023) and Scion (Palmer, M., 2023) provide overwhelming evidence that pine plantations are failing on erosion-prone land in Tairāwhiti and Northern Hawkes Bay at a much higher rate than expected and much more than indigenous land cover (including monoculture kānuka and mānuka) suggesting pine should not be permitted on any erosion-prone land (which comprises 88% of all land in the Tairāwhiti region).
- While pine is fast growing, it has had 100 years of breeding R&D, largely at the taxpayers' expense; there are fast growing native species that could be produced at scale to provide a nursery for more diverse native forests to become established.
- In addition to this I support the use of strong compliance measures to ensure the transition from exotics to native vegetation is happening over time.
- Additional management needs to be required across all permanent forestry participants to restrict landowners and overseas investors from planting 'permanent' plantations and walking away without following best management practices.
- Management rules need to be practical for the landowners' circumstances and be commensurate with the level of risk.
- Smaller landowners should have more flexible requirements or receive additional support to avoid additional burden where it is not required. Requirements should be commensurate to the size, scale, location, and species of the forestry.

- It is important that any changes to the permanent forestry category reflect the cultural impacts of ongoing lack of indigenous forest and support rural economics and communities. This should be strongly considered as part of the review.
- The biodiversity and sequestration contributed on farms needs to be recognised through the NZ ETS or a separate mechanism.
- On-farm emissions need to urgently come into the ETS or He Waka Eke Noa, but without decades of free emissions.

Establishing permanent indigenous forest at scale – suggested framework

We have not yet achieved sustainable land use in Aotearoa/New Zealand. Land use mapping to match land to suitable land uses has been undertaken and the necessary land use changes have yet to occur.

In regions like Tairāwhiti where 88% of land is erosion-prone, we need long-term permanent native forest cover on land unsuitable for agriculture and pine plantations. There are several pathways to achieve this objective depending on the situation.

Primary considerations for determining if transition is possible include:

- biodiversity gains;
- catchment risks (LUC classification) and restoration gains (sediment control, flood reduction, summer stream supplies);
- resilience to fire, drought, disease, and wind;
- site specific considerations including climate variability, availability of diverse native seed sources, pest animal and plant threats and land stability risks.

Initial site vegetation characteristics or types can include:

Type 1. existing natural revegetation – mixed fern and monocultures such as mānuka/kānuka;
Type 2. existing pine plantation (and potentially other exotic plantation species); and
Type 3. unforested land – with pasture or weeds.

For Type 1 land with existing natural revegetation the land should be left to continue naturally reverting with management assistance limited to weed control and planting of 'seed islands'. Planted seed islands are necessary where locally-appropriate shrub and tree species are missing within the local catchment. With pest control, biodiversity value will increase as the natural reversion moves through the successional stages towards a mature forest. Browsers control will not only improve biodiversity, but also the severely reduced ability of our existing forests to intercept and absorb water essential for flood protection and continuous summer flows, due to the loss through browsing of diverse forest understory and thick forest floor litter layer/duff.

For Type 2 existing pine plantations, the pines provide weed suppression, limited land stability, hydrological stability (flood reduction and enhanced summer stream flows), carbon absorption and limited indigenous biodiversity values. Changing management objectives from clear-fell harvesting to transitional forestry may allow existing values to be protected and enhanced. A clear definition of a 'transitional' forest is required as well as a significant proportion of income (at least 50% of carbon income) set aside for the investment required in pest control and monitoring to ensure biodiversity goals are achieved and built on over time.

For Type 3 land where natural revegetation is hindered by factors such as high weed competition, erosion risk or effects of climate change (e.g. drought), then native planting and/or seed distribution could be undertaken with specific varieties used as nurse crops to support and speed up diverse native forest establishment. Timber production would be excluded as an objective, but instead, management priorities would be to enhance carbon absorption and land stabilisation, and provide suitable conditions for native shrub and tree seedling establishment. The objectives would need to be protected through covenants.

Active landscape management is required now to effectively reduce carbon dioxide levels by 2050, meet water quality requirements and slow biodiversity loss. Any alternative strategies to achieve this would need to be assessed against the near timeframe as well as a more distant timeframe required to establish the ultimate objective of permanent indigenous forest.

The current land management situation will not achieve the desired land use change goals. A key change that is required is landscape level browser control to achieve the end goal of restoring long-term permanent native forest cover over hundreds of thousands of hectares of vulnerable land. This is a basic requirement; whether it is for naturally regenerating native vegetation or for a managed transition of exotic to native forest.

This is a nuanced issue that involves all of government, including local government, and communities having a clear set of objectives, principles and priorities so that actions are undertaken knowing where we want to get to - permanent indigenous forest at scale.

Tailored Energy Solutions Ltd submission to the Ministry for the Environment on:

Te Arotake Mahere Hokohoko Tukunga Review of the New Zealand Emissions Trading Scheme: discussion document

August 2023

To: Ministry for the Environment etsconsultation@mfe.govt.nz

From: Glenys Perkins, managing director, Tailored Energy Solutions Ltd, office@tesl.co.nz

INTRODUCTION TO TAILORED ENERGY SOLUTIONS LTD

TESL supplies fossil fuels and renewable fuels to industries and building owners who require heat, ranging from family-owned commercial greenhouses to large food processing companies. We, therefore, take a close interest in climate change policy and implementation. We also purchase New Zealand Units on behalf of many of our clients to help smooth their path to compliance with the New Zealand Emissions Trading Scheme.

As the former climate change ambassador Adrian Macey has repeatedly stated and written, it will be impossible for Aotearoa New Zealand to meet, domestically, its Nationally Determined Contribution to the 2015 Paris Agreement. Inevitably, we will have to buy international carbon credits from markets that currently do not exist, and may never exist, in terms of gaining access to them.

This point alone makes a mockery of New Zealand's climate change policy and action, as practised for decades, and at least since 2015. In this light, the Government's ETS review is timely. We welcome the opportunity to make a submission.

This submission is structured as follows:

- An executive summary in bullet points
- Answers to consultation questions in table form

EXECUTIVE SUMMARY

- The discussion document misrepresents the reality of climate change action in New Zealand, and almost completely ignores the international context.
- The international context is the only context that matters in addressing the global climate change issue – the Government's refusal to discuss it is very unhelpful towards real solutions.
- None of the options proposed for ETS reform are credible.
- TESL proposes abolishing the ETS because it has failed to achieve anything except to subsidise exotic plantation forestry, and impose a tax on emitters.
- Replace the ETS with a carbon tax, and use tax revenues to improve New Zealand's infrastructure and ability to take on new technologies, when they become available.
- There is potentially a role for a voluntary carbon market – this idea in the discussion document is worth further consideration and policy development.
- Abolish all penalising complementary measures, in light of "real world constraints" on the pace of uptake of lower-emissions technologies.
- Introducing new policies to fix earlier ones that didn't work as intended, or which are inequitable, ineffective or inefficient, is clearly bad policy-making.
- Prevent further large-scale plantings of exotic trees, in particular, conifers, because they are toxic to land and waterways, and cause other adverse environmental effects.
- Prevent the Government buying NZUs, to avoid a new source of market failure.
- We urge the Government to not bring agriculture into the ETS – no other country puts a price on agricultural greenhouse gas emissions, for reasons that should be obvious.

ANSWERS TO QUESTIONS

Chapter 2:

Discussion document questions	TESL feedback and opinion
2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?	The discussion document implies that the ETS does not work as intended, and has never worked as intended. All it does is reward radiata pine growers / harvesters, and penalise emitters who often have no alternative but to pay for NZUs to remain compliant with the Climate Change Response Act 2002. The ETS has been, therefore, a failed policy since its conception by the Helen Clark-led government. On top of that, this Government has introduced a series of "complementary measures" in an ad hoc way, and lacking in any useful strategy or purpose. The result is to turn New Zealand into a "hermit kingdom" as regards emissions pricing. No other country in the world – with few exceptions

	– is undermining their domestic economy and society as we are, in the name of climate change action. We urge the Government throughout this submission to abolish the ETS because it is a policy failure, and replace it with a suitably configured carbon tax.
2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?	As the Government knows, both ETS prices and complementary measures are adversely affecting businesses, on top of Government mishandling of the Covid pandemic, and the resulting plunge into recession. There used to be more than 50 commercial greenhouse businesses in Canterbury alone. Now there are seven. It is fair to say the causes are multiple, and it is also fair to say that ETS prices are driving many growers out of business, to be replaced by imports from Australia where – to add insult to injury – there is no price on carbon. Other major industries requiring process heat have left the Canterbury region for overseas locations due to New Zealand's aggressive ETS. The cost to the New Zealand economy, or top certain regions, of the introduction of the ETS has not been measured. We argue that since the ETS is clearly not working as intended, the Government needs to carry out a total rethink, instead of persisting with "band aid" thinking, eg the present ETS review. The Government is poised to price agricultural emissions. New Zealand would be the only country in the world to do that to its agricultural sector. The hermit kingdom is again out of touch with reality.
2.3 Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?	It is clear that if the Government subsidises plantation forestry, the country will see more of it than would otherwise take place. In relation to enquires from overseas companies wanting to invest in the New Zealand carbon market – we ask: is this a sound move for New Zealand? In our view, this would create an opportunity for money laundering through carbon investments. Has the Government consulted with the Financial Markets Authority on this issue?
2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?	It is our experience that exotic trees planted in New Zealand have not been successful, in a holistic sense. We urge the Government to prevent further planting of exotic trees in New Zealand – our climate, weather and soils are not suitable for large-scale exotic tree production. These tree types, ie *Pinus* spp, are extremely toxic to our soils and waterways – once again, an understanding of the effects of introducing a large-scale foreign product has not been well thought through. As mooted by our farmers, our productive food-producing farmlands are too precious to plant out in harmful, exotic trees.

Chapter 3:

Discussion document questions	TESL feedback and opinion
3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.	No. ETS prices are going to be either: too low to drive change, or risk putting many emitters out of business, with no benefit for world climate. As a company active in the boiler industry, our analysis is that the abatement cost for many sites runs into the hundreds of dollars per tonne of CO_2 avoided, at which point affected businesses and entities will no longer be in business or operating. Those businesses where possible will migrate to a more sustainable location / country that is more welcoming to their operations. One reason is that a boiler designed to burn coal is not designed to burn any other fuels, ie biofuels / wood, and suffers damage as a result. New boilers are not cheap. In the South Island, especially, there is no other secure source of process energy besides coal – the Government should at least engage with these sites that require high levels of process / sterilising heat to learn more about the challenges they face. The point is that in the South Island there is insufficient biofuels supply to meet industrial process heat demand, or the ability to deliver electricity economically to meet that demand. The Government's insistence on being a world leader on climate change action presents New Zealand with huge risks to our economy and society, for no benefit to world climate. We ask: why would the New Zealand Government consider that it has any role as a world leader on climate change action? It would make more sense to incentivise uptake of new technologies, when they become available, commercially and at scale. In our experience, the alternative fuels have a higher CO_2 impact than fossil fuels. We urge the Government to get educated on the reality of biofuels versus coal as a source of process heat. Experts in the field who have extensively researched this issue include Rob Boyd at Bathurst Resources Ltd.
3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?	No. The writers of the discussion document do not understand the electricity market: there is a big difference between how much it costs to generate electricity, and the prices that New Zealanders actually pay for electricity. There is no discussion of the cost of food or the cost of living, or that New Zealand is in recession. The lack of understanding of the economic reality displayed in the discussion document is such that the only reasonable course is to drop this review immediately, and commission people with appropriate expertise to restart it from scratch. Having been involved in the New Zealand energy industry since the inception of the ETS, I (Glenys Perkins) have experienced varied levels of destructive policies in the management / delivery, and constant

	tweaking of the ETS, that can only be attributed to a total lack of understanding of the New Zealand economy and its energy requirements. Government policy appears to proceed by whim, defying logic on any level. Furthermore, there appears to be no monitoring of, or any government held to account, for their adverse impacts on the economy via bad policy. The harm the present Government is doing to New Zealand is becoming more evident by the day as more New Zealanders slip below the poverty line. My experience with MfE officials on the ETS has left me disillusioned with the level of understanding / intellect at government level – we as a country appear to have lost all common sense and ability to discern facts from fiction, and wishful thinking from reality. There appears to be no fact checking ahead of the Government introducing more flawed policies relating to the New Zealand energy market. To conclude: the cost or security of supply of alternative New Zealand-made and manufactured coal cannot be matched by imported fuels or biofuels at any level. This is a simply a fact.
3.3 How important do you think it is that we maintain incentives for removals? Why?	Unless emitters can find a way of offsetting their emissions, they will not be able to comply with New Zealand's ill-considered climate change policies. There needs to be open and **honest** dialogue between all parties involved in the NZ ETS.

Chapter 4:

In TESL's experience, Māori are people like anyone else in New Zealand; they have a range of views on any issue, and live their lives in different ways, just as non-Māori do. In this context, Chapter 4 and all content that seeks to separate Māori from non-Māori is nonsensical. One might as well ask whether lefthanders (11% of the population) are more or less affected by climate change as righthanders.

Chapter 5:

Discussion document questions	TESL feedback and opinion
5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?	No. As discussed above, the ETS is senseless public policy. We propose closing down the ETS, and that the Government replace it with a carbon tax as originally proposed. I was involved in the original discussions on the introduction of a carbon tax, which has merit. A carbon tax that does not put emitters out of business could generate revenue for the Government to smooth the path of uptake of lower-emissions technologies. For example, as soon as electric vehicles are cheaper to buy and run than ICE vehicles, for the same performance, people will buy EVs.
5.2 Do you agree that the NZ ETS should support more gross	Let's drop the ETS, and concentrate instead on technology uptake etc, "as quickly as real-world constraints allow". This is a crucial phrase, and

emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?	it should headline all of the Government's thinking on climate change action.
5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?	Emitters should be able to offset at least some of their emissions via existing forestry. This could be done via a voluntary market, and this is one of the few ideas in the discussion document that we support.
5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.	No. The discussion document largely misrepresents the reality of climate change policy, and fails to discuss the global context. This is an "ostrich with its head in the sand" approach to public policy, and inexcusable for an OECD country. We propose dropping this review immediately, and starting again from scratch by commissioning people who know what they are doing in this space.
5.5 Are there any additional criteria or considerations that should be taken into account?	The discussion document fails to consider the global context. Officials could read the World Bank's recent report on the state and trends of carbon pricing. The key figure is that only **23%** of global GHG emissions face any emissions pricing. Within that group, New Zealand is one of the leaders in carbon pricing. This alone should convince the Government that it is wrong for a country at the end of the world with a very small population to try to be a world leader on climate change. We can be a fast follower. We have noticed in this respect that Climate Change Minister James Shaw no longer talks about being a world leader after he spoke to an almost empty room at COP 26 in Glasgow, Scotland in late 2021.

Chapter 6:

Discussion document questions	TESL feedback and opinion
6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?	None of them. The discussion document proposes a set of options, all of which are implausible. Back to the drawing board, as proposed earlier in this submission.

6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.	No. The discussion document fails to provide a balanced or informed presentation of the reality confronting New Zealand and the world on climate change.
6.3 Of the four options proposed, which one do you prefer? Why?	None: they are all implausible options, and reflect the reality that the ETS is fundamentally flawed. That being the case, the ETS is impossible to fix in any credible or useful way. As above.
6.4 Are there any additional options that you believe the review should consider? Why?	Drop this ETS review; abolish the ETS; start again with climate change policy.
6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?	See above.
6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?	People are people. To say otherwise would be racist, no?

Chapter 7:

Discussion document questions	TESL feedback and opinion
7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?	This would be a mixing of objectives, and, therefore, doomed to failure. If the Government wishes to see more indigenous forests in New Zealand, that should be the subject of policy development in its own right. We certainly support more indigenous forests.
7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?	None. This is an area where measurement, ie the calculation of removal factors, is extremely challenging. While on this subject, New Zealand has vast areas of wetlands, not captured by Stats NZ. Many are on conservation land, and/or at altitude. Most of the South Island's West Coast is wetlands because it is a wet land. The Government should not fret about wetland loss.
7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?	Not answered.
7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or	Not answered.

recognising other sources of removals? Why?	

WORLD RESOURCES INSTITUTE

THE GLOBAL LAND SQUEEZE: MANAGING THE GROWING COMPETITION FOR LAND

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Foreword

Competition for the world's finite land resources is rapidly intensifying. Around 85% of the world's usable land—ice-free and non-desert—has already been heavily harvested for wood or converted to agriculture. This conversion has contributed roughly a quarter of the carbon that humanity has added to the atmosphere and explains most of the planet's vast loss of biodiversity.

Human demand for food, wood, and space continues to rise even as the climate science makes it clear that preserving forests and other habitats is more vital than ever. Due to rising populations and incomes, WRI models find the world is on course to demand more than 50% more food and wood in 2050 than in 2010. At present rates of rising yields, the world will convert an area of natural habitat up to two times the size of India for agriculture to supply this food. Meeting rising wood demands will also likely lead to decades of carbon losses on par with effects of agricultural land expansion in recent years.

This global land squeeze is a pressing challenge, one that requires thinking differently about humanity's use of land.

Governments, companies, organizations and people everywhere must start by understanding that every hectare of productive land is valuable, whether for producing food or wood or storing carbon and supporting biodiversity. Every hectare of land used to supply human consumption comes with a high "carbon opportunity cost." Despite this inherent cost, some government policies are deliberately increasing demand for land by creating incentives to harvest more trees or grow crops for bioenergy. These policies could more than double the demands people place on land, destroying habitats and releasing vast stores of carbon into the air.

We need a systems approach that stops treating land as "free" and successfully evaluates how the burdens of meeting human needs might be transferred from one place to another. In short, we need an approach that recognizes how land may be our most limited resource.

With this core assumption in place, the path forward becomes clearer. This report frames the broad challenge, exploring our options for solutions. The "Produce, Protect, Reduce and Restore" framework offers a holistic solution to land in both our consumption and production practices.

First, we must find a way to Produce more food and wood on existing agriculture and timber lands. If done right, these changes can also boost incomes and reduce hunger. At the same time, the world must also move to Protect native habitats and their precious carbon and biodiversity through governance. This requires that people around the world Reduce our consumption of land-intensive products – for example by eating less meat, wasting less food, reusing more wood, and dedicating less land to bioenergy. Finally, we must Restore forests and wetlands on those agricultural lands where carbon and biodiversity benefits are exceptional, or where food production potential is low.

With populations rising and climate change accelerating, the world is becoming an ever-tighter place. Luckily, we already know numerous technological and social solutions and have valuable innovations that are ready to be pursued. By pursuing the right set of solutions, humankind can not only fit on the world's land, but thrive together with nature and a healthy climate.

Ani Dasgupta

President and CEO
World Resources Institute

Executive Summary

The world faces a global land squeeze as the world population grows to 10 billion by 2050. Human demands for food, wood products, and urban uses will expand as the population grows and incomes rise. These demands will lead to more conversion of native habitats to agricultural and urban uses; in addition, more natural forests will be converted to wood plantations and increasing amounts of wood will be harvested from relatively natural forests. This growing demand for land-based products will compete with the ability of the remaining native habitats to store carbon and support biodiversity.

Highlights

- The world faces a "global land squeeze" with population and income growth threatening climate and biodiversity goals. We project business-as-usual (BAU) increases in demand for crops (56 percent), meat and milk (70 percent), and wood (54 percent) between 2010 and 2050, requiring an additional 600 million hectares (Mha) of agricultural land, 80 Mha of urban land, and harvests of 800 Mha of forests.
- We project 6.0 gigatons of carbon dioxide equivalent ($GtCO_2e$) in annual land-use-change emissions to satisfy global food demand, 0.7 $GtCO_2e$ per year for urban expansion, and 3.5–4.2 $GtCO_2e$ in annualized time-discounted emissions for meeting wood demand, or 2.6-3.2 $GtCO_2e$ when including 1 Gt of substitution benefits for reduced concrete and steel.
- Initiatives to increase demands for bioenergy and mass timber for construction would vastly increase land-use competition.
- Wood use is not "carbon neutral," even if forests are managed sustainably once one accounts for the loss in forest carbon from harvests. In most scenarios, harvesting additional wood, even for construction, will likely increase atmospheric carbon for decades.
- Solutions require strategies that produce, protect, reduce, and restore: produce more food and wood on already managed land, protect native habitats, reduce demand for land-intensive products, and, if successful, restore forests and other habitats.
- In general, policies should not increase demand for land-based products until the world shows that it can meet rising food and wood demands without additional land conversion.

The growing demand for land-based products, such as food and wood, presents a great environmental challenge. Virtually all climate change pathways that keep global temperature rise below 1.5°C require quickly ending net deforestation and reducing agricultural land use and achieving net reforestation by 2050. The world already is facing a species extinction whose primary drivers are the conversion of native habitats to other uses and the management of forests for wood supply. Scenarios that meet future food needs and expected levels of increased wood demand—without further conversion or net disturbance of the world's forests—are likely possible but highly challenging. Scenarios to meet these needs and also free up land to restore forests and other native habitats to provide biodiversity and store carbon require unprecedented action, technological progress, and political will.

Even as the world faces this land squeeze, many policymakers and researchers are proposing policies that add to these human demands for land-based products. For example, policies to increase the use of bioenergy or wood in construction potentially increase demand beyond business as usual (BAU) growth. Proponents claim these additional land uses will help address climate change. Yet how much could these policies increase global competition for land? And would adding these demands help reduce or exacerbate global warming? If so, under what conditions?

This analysis builds on the World Resources Report *Creating a Sustainable Food Future* to assess the global land squeeze and options to manage it in the coming decades to meet human and environmental needs (Searchinger et al. 2019). Using the academic literature, a variety of data sources, prior World Resources Institute (WRI) analyses, and detailed new forestry modeling, this report summarizes the extent of global land-use competition, analyzes the implications of increasing land-use demands, and describes the suite of strategies to meet rising human needs while preserving biodiversity and carbon stored in vegetation and soils. The analysis builds on work undertaken for *Creating a Sustainable Food Future* by WRI with the

World Bank, the United Nations Development Programme, United Nations Environment Programme, the French Agricultural Research Center for International Development, and the French National Institute for Agricultural Research. To analyze the land and carbon implications of forest product demand, WRI developed the new biophysical Carbon Harvest Model (CHARM) for this report.

Global Land Conversion, Carbon Losses, and Ongoing Changes

The world's lands are already heavily used. Based on our review and analysis of the literature, people had converted nearly half of all vegetated land to agriculture and had harvested or manipulated 60–85 percent of the world's remaining forests by 2010. Between 1700 and 2000, humans also converted or heavily transformed more than 90 percent of the world's native grasslands and 80 percent of its native shrublands and savannas. These changes are the primary drivers of biodiversity loss and have contributed between one-quarter and one-third of the carbon people have added to the atmosphere.

Land-use change is continuing apace. Although estimates vary, according to Global Forest Watch data, people are likely responsible for the gross loss of roughly 15 Mha of forest cover per year since 2000. The best evidence of cropland expansion from a satellite study (Potapov et al. 2022) shows that the net conversion of land to annual cropland has increased from around 5 Mha per year for annual crops between 2004 and 2007 to 10 Mha per year between 2013 and 2019, with other evidence suggesting another 1 Mha per year for expansion of perennial crops such as oil palm and rubber. Gross conversion is nearly twice the net. Because of limitations in how satellites read pasture and some reported declines in very dry pasture, net pasture expansion by area is uncertain. But gross pasture expansion is the primary driver of tropical forest loss overall, which strongly suggests that more carbon and biodiversity is being lost from changes in pasture overall.

Estimated Land-Use Demands (2010–2050) without Major New Policies

Agricultural Land Expansion

Growing food demand is likely to lead to 600 Mha of agricultural expansion between 2010 and 2050. Under BAU, WRI estimated in the report *Creating a Sustainable Food Future* that crop calorie demand will grow by 56 percent during that period, and demand for meat and dairy by 68 percent. Assuming that crop yields and meat and milk output per hectare of pasture continue to grow roughly at historical (linear) rates since 1960, we estimate that cropland will expand on a net basis by about 200 Mha—roughly 5 Mha per year—and pasture by 400 Mha between 2010 and 2050. Collectively, these 600 Mha of agricultural expansion are nearly twice the size of India.

BAU agricultural expansion would lead to ongoing land-use change and unacceptably high greenhouse gas (GHG) emissions. According to our modeling, agricultural expansion at the expense of forests and woody savannas, along with ongoing degradation of peatlands, would release roughly 240 $GtCO_2e$ into the atmosphere over the 40-year period, or 6 $GtCO_2e$ per year. These emissions are 25–40 percent of the maximum cumulative carbon dioxide emissions "budget," as estimated by various studies, between 2010 and 2050 to limit warming to 1.5°C–2°C.

Evidence from the 2010s shows that agricultural expansion and related land-use change remain key challenges. Since our 2019 projections, which relied on data available only through 2011, growth in crop production, and overall production of livestock products, has roughly tracked our projected rates out to 2050. One exception is that growth in ruminant meat production has occurred at roughly half our projected rate. Although that is good news in one way, our analysis of data from the Food and Agriculture Organization of the United Nations (FAO) shows that this lower growth rate has occurred due to almost no growth in per capita consumption in the world's poor countries rather than from a sharp drop in per capita consumption among the world's wealthy. Limited income growth during the 2010s in sub-Saharan Africa may be

a major factor. Furthermore, as discussed above, direct estimates of cropland expansion are now occurring at annual rates that are almost double our projected annual rates over 40 years.

Urban Land Expansion

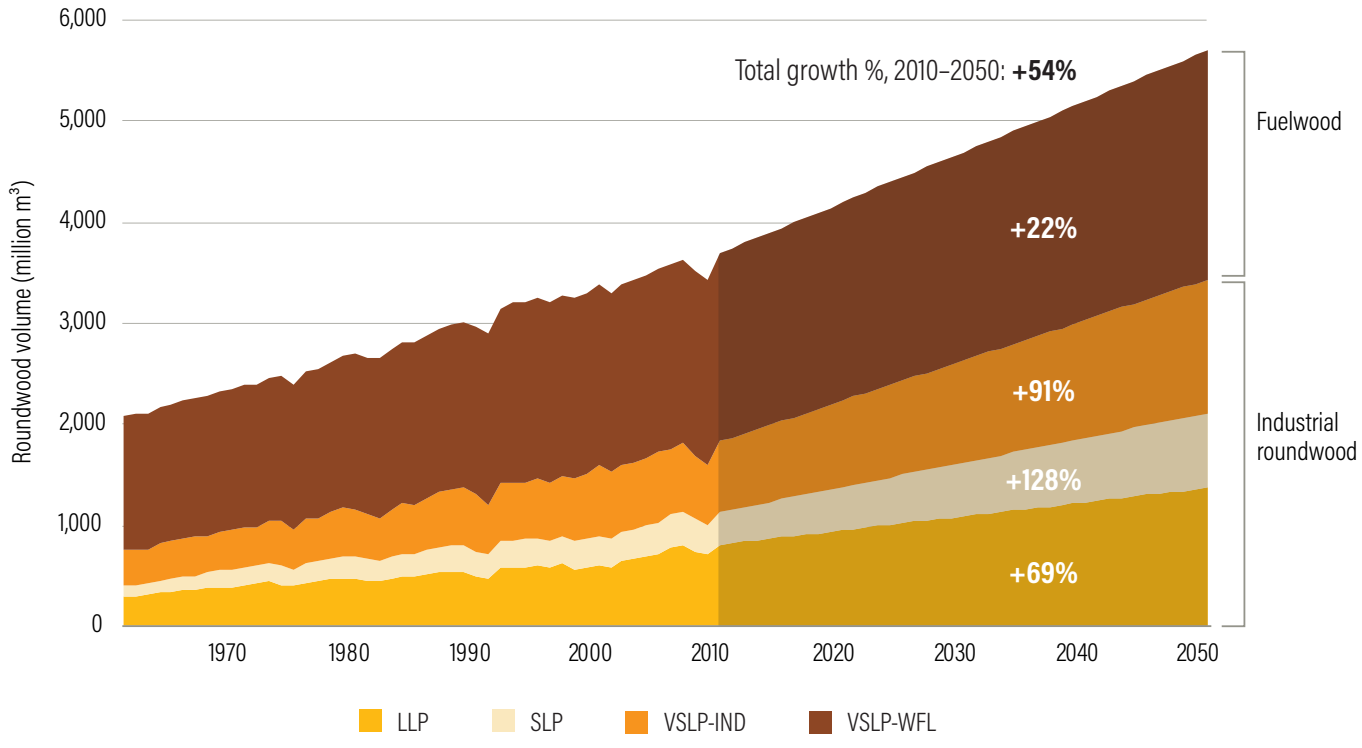
Urban land expansion will further add to human land demands. Based on our literature review, midrange estimates for urban land expansion are roughly 80 Mha between 2010 and 2050. Our modeling indicates that expansion will contribute to land demands that would cause 27 $GtCO_2e$ of additional carbon dioxide emissions during the 40-year period, or about 0.7 $GtCO_2e$ per year, further adding to the climate challenge.

Forestry Effects

In addition to agricultural and urban expansion, wood harvesting from forests is also likely to increase, adding to human land demands and effects on climate and biodiversity. Forestry impacts are often left out of global land-use analyses, but wood harvesting also causes impacts on biodiversity and reduces carbon stored in forests for decades or more.

We project a BAU 54 percent increase in overall wood demand between 2010 and 2050, including an 88 percent growth in the industrial wood harvest and a 22 percent growth in fuelwood (Figure ES-1).

Figure ES-1 | We project a 54 percent increase in total wood production between 2010 and 2050 under "business as usual"



Note: LLP = long-lived product (such as wood timber and panels); SLP = short-lived product (mainly paper products); VSLP-IND = very-short-lived product (mainly wood burned for energy as a by-product of other wood production); VSLP-WFL = very-short-lived product for traditional fuelwood use (such as firewood, charcoal, and wood pellets). The projected percentage increases from 2010 to 2050 are listed for total products and each category.

Source: Authors' estimates.

The industrial wood harvest includes solid timber, various wood panels, and paper and cardboard products. These estimates are moderately higher than those projected by a recent FAO model, partly because of newer, higher estimates of global gross domestic product (GDP) per capita and population growth in developing countries.

Meeting wood demand would likely require harvesting about 600 Mha of secondary forest between 2010 and 2050, in addition to 200 Mha of existing plantations. Because this growth in wood demand could be met in different ways, we analyze a variety of scenarios. We assume that future wood harvests will use the 200 Mha of tree plantations that existed in 2010, and we project that, based on other wood sources, an area of secondary or primary forests equal to 530-650 Mha must also be harvested. Figure ES-2 shows the results according to scenarios described in Table ES-1. Areas shown are in "clear-cut" equivalents—in other words, the hectares of forest that would be harvested if all wood were supplied by clear-cuts. (Selective harvests reduce impacts per hectare harvested but require more hectares.) The variation depends on the location and productivity of the natural forests, the extent to which they are converted to plantations, and the extent to which new plantations are established on agricultural land.

Table ES-1 | Description of Modeled Scenarios for Future Wood Supply

SCENARIO NAME	DESCRIPTION OF SOURCES OF WOOD	ADDITIONAL ASSUMPTIONS
(1) Secondary forest harvest and regrowth	Existing plantations and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands
(2) Secondary forest and conversion	Existing plantations and secondary forest harvest and then converted to productive plantations	The portion of wood supply from secondary forests is 100% from middle-aged stands
(3) Secondary forest mixed harvest	Existing plantations and secondary forest mixed harvest and regrowth	The portion of wood supply is 50% from middle-aged and 50% from mature secondary forest
(4) New tropical plantations	Existing plantations, secondary forest harvest and regrowth, and tropical agricultural land gradually converted to plantation	Rotation length of new tropical plantations is 7 years; 2 million hectares per year of tropical agricultural lands are converted to plantations each year
(5) Higher plantation productivity	Existing plantations with 25% increase in plantation growth rates and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands
(6) Higher harvest efficiency	Existing plantations with 25% increase in plantation growth rates and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands
(7) 50% less 2050 fuelwood demand	Fuelwood demand decreases linearly to reach 50% of 2050 baseline demand, existing plantations, and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands

Source: Authors' calculations.

Figure ES-2 | We project 756-855 Mha of wood harvest for 2010–2050 (clear-cut equivalents)

Note: BAU = business as usual.

Source: Carbon Harvest Model.

Harvests reduce carbon storage in forests both because wood is removed from the forest and much of the wood felled is left to decompose. Much of the removed wood is quickly burned, releasing its carbon, and other wood-based carbon is temporarily stored in short- or long-lived products. Forests then regrow. For at least a few years, they are likely to grow more slowly than forests left unharvested, but then they start to grow faster. Over enough time, they recoup much to nearly all of the carbon lost. The carbon "cost" is therefore in part a time-limited increase in carbon in the atmosphere. If forests are repeatedly harvested, they will also store less carbon on average.

To analyze these costs, we developed a new model, CHARM, which follows a long-established approach to track the carbon across all "pools" of carbon storage. Any carbon not stored in some pool is by definition emitted to the air.

Reflecting the added value of immediately reducing emissions, we also value the importance of earlier mitigation more than later mitigation. Restraining emissions in the next few decades not only reduces climate damage during that time but also creates more time for the world to mobilize the technology and resources to permanently stabilize the climate.

To reflect the value of time, our primary analysis applies a discount rate (4 percent); thus, if a ton of carbon is emitted in the first year, then even if it is reabsorbed 40 years later, the loss of carbon in the interim is still treated as a cost to climate change. (All tons are metric tons unless otherwise indicated. The discount rate is not discounting emissions per se but rather the cost of emissions and, therefore, the value of mitigation at different times.) We also apply other approaches to reflect the cost of short- to medium-term increases in carbon, including focusing on the change in carbon in the atmosphere after 40 years.

Our accounting approach differs from many others that either fail to account for future forest regrowth or inappropriately view harvests as carbon neutral so long as forest carbon stocks remain stable on average. Some papers, such as Houghton and Nassikas (2018), have estimated the gross carbon costs of annual wood harvests, which is the carbon released by each year's wood harvests. This approach captures the effect of a harvest but does not factor in the faster forest regrowth in the future. As we show in an extensive literature review, other papers treat the harvest of wood as carbon neutral (i.e., as doing nothing to increase carbon in the air) so long as wood is harvested sustainably. *Sustainably* typically means that harvests of trees are limited to match the forest's annual growth so that the existing "carbon stock" in the forest is maintained. We consider this approach incorrect. If forests would increase in carbon in the absence of harvesting, then harvesting and only maintaining their carbon stocks decreases the carbon that otherwise would have been stored in the forest, thereby increasing carbon in the air compared to leaving the forest alone.

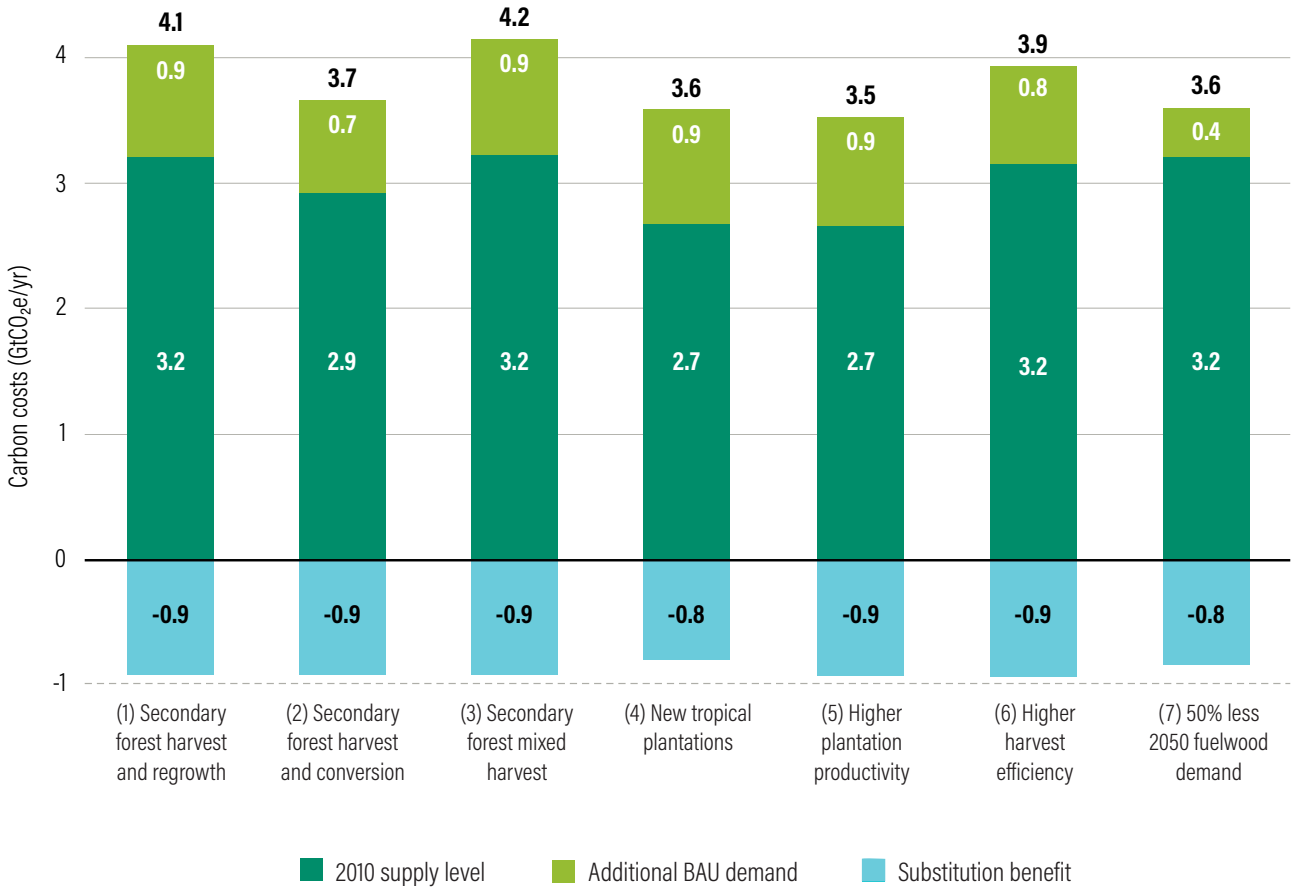
This accounting also ignores the fact that although many countries' forests are regrowing due to heavy prior harvests, this regrowth of previously cut forests would occur anyway (i.e., regardless of whether new harvests are occurring). As a result, this forest regrowth is not caused by the new harvests and does not alter the climate consequences of the new harvests. In fact, forests all over the world are growing faster because of higher carbon dioxide in the atmosphere and climate change itself. These are beneficial feedback effects of climate change that already are factored into scientific "baseline" estimates of future climates; without this forest carbon sink, climate change would be far worse. This sink is not disposable if the world is to achieve its climate goals. Removing the sink through harvest means more carbon in the air.

Using our time-discounted approach, we estimate that forest harvests between 2010 and 2050 will cause annual emissions of 3.5–4.2 $GtCO_2e$ across different scenarios (as described in Table ES-1) for meeting future wood demand (Figure ES-3). Even without any future growth in wood demand, we estimate that these forestry-related emissions would likely be roughly 3.2 $GtCO_2e$ per year. These emissions are increases in carbon in the atmosphere.

There is also value in estimating the "net" effects of forestry if we factor in the lower fossil and related emissions in making wood for construction compared to concrete and steel. When we factor in our best global estimate of the global substitution value of wood for concrete and steel of roughly 0.9 $GtCO_2e$ avoided per year, the annual net effect of forestry is therefore 2.6-3.2 $GtCO_2e$.

These estimates of the climate impacts of forest harvests are calculated using time discounting and a 4 percent discount rate, but the undiscounted results after 40 years are similar. Substitution effects do not alter the absolute emissions from wood harvest, but they do allow a comparison of wood use versus nonwood use if nothing is done in the future to reduce emissions from concrete and steel. (In the same way, driving a small car emits carbon even if its emissions are lower than driving a large car.)

Figure ES-3 | We estimate 3.5–4.2 Gt per year of carbon emissions from global wood harvest (2010–2050) with roughly a 0.9 Gt per year benefit from replacing concrete and steel



Note: BAU = business as usual. These estimates show the time-discounted approach at 4 percent assuming all forests are allowed to regrow for 40 years after harvest.

Source: Carbon Harvest Model.

Beyond BAU: The Implications of Policy-Induced Increases in Land and Wood Demand (2010–2050)

Policymakers have enacted or are considering policies to increase demand for wood or crop-based products, which would require use of additional land, based on the theory that increasing use of these products helps to combat climate change. One set of policies promotes liquid biofuels from food and energy crops or the burning of wood for electricity or heat. Policy examples include biofuel blending mandates and renewable energy standards in the United States and Europe. Other contemplated policies, such as those generally proposed by the European Commission in its Forest Strategy for 2030, would promote increased harvesting of wood for construction, including use of wood in tall buildings, an approach known as "mass timber." Such a strategy often relies on new types of thick wood panels formed by gluing thinner boards in perpendicular shapes, of which the main example is cross-laminated timber.

Policy ideas that increase demand for land-based products raise important questions around climate benefits and land availability. Will bioenergy or mass timber policies reduce net GHG emissions? They can only reduce emissions if the reductions in the energy or construction sectors exceed any increased emissions from loss of carbon in the land-use

sector. Furthermore, even if harvesting additional land-based products would be advantageous for a single project, is land available for the additional energy or construction products if they are demanded at a large scale? For example, if a hectare of existing forest plantation were diverted to produce wood products for tall buildings in a way that provided climate benefits, that diversion might require even more natural forest to be harvested or converted into a plantation elsewhere to replace the diverted wood for furniture and paper products. Similarly, unless the demand for global agricultural land can be reduced overall, diverting a hectare of grazing land in South America to another use (e.g., to forest plantation) would require clearing of another hectare of forest or savanna for agriculture elsewhere to replace the lost food production.

Land Demands and Carbon Implications of Bioenergy Expansion

Policies to support bioenergy could result in vast increases in wood harvests or in the use of land to generate biofuels. For example, providing just 10 percent of transportation fuels from crop-based biofuels by 2050 would likely provide only 2 percent of global energy use in 2050 on a net basis; however, it would require roughly 30 percent of the energy in all the world's crops as of 2010. Doing so would increase agricultural land area by an additional 100 Mha (beyond BAU expansion) and release an additional 1.3 $GtCO_2e$ annually from land-use change over 40 years. Furthermore, meeting an additional 2 percent of global energy demand through solid biomass from wood would require roughly doubling the present global commercial wood harvest. The gross emissions would exceed 3 $GtCO_2e$ per year.

Analyses that find large benefits from bioenergy typically (and incorrectly) treat biomass as "carbon neutral," which means they do not count as emissions the carbon dioxide emitted by burning or decomposing biomass. The typical justification for doing so is that the carbon emitted by biomass burning was absorbed from the atmosphere by growing plants. The theory, in effect, is that bioenergy just recycles atmospheric carbon unlike burning fossil fuels, which adds carbon to the air otherwise stored underground.

However, analyses that treat biomass as inherently carbon neutral are incomplete because it takes land to grow plants for bioenergy. Using this land to produce plants for bioenergy is a benefit of using land, but the climate cost is not using the land for other valuable purposes. Those purposes can include storing carbon directly in forests. They can also include producing food or fiber, which frees up other global land to store more carbon while still meeting food demands. The assumption of carbon neutrality of biomass in effect treats land from a climate perspective as having no opportunity cost. That means, from a climate perspective, that the analysis treats land as "free."

Factoring in an opportunity cost of land fundamentally changes the analysis of bioenergy and shows that dedicating land to bioenergy production is harmful for the climate. One way of estimating the opportunity cost of land when producing a liter of biofuels is to estimate the average quantity of carbon lost from vegetation and soils to yield the amount of the crop used to produce. This quantity can then be amortized over a number of years of bioenergy production, which policymakers have typically chosen as 20 or 30 years. Using 30 years, analysis shows that the GHG emissions from using grain ethanol for bioenergy are double those of using gasoline, and the emissions from vegetable oil-based bioenergy are triple those of gasoline.

Another "opportunity cost" approach would compare the emissions from fossil fuels avoided by using a hectare of land to produce bioenergy with the quantity of carbon that would likely be sequestered allowing that land to reforest. Reforestation typically would reduce atmospheric carbon more (versus the fossil fuel savings). As a result, even if there were surplus farmland, the net climate effect of biofuels would still be adverse compared to this alternative use of even surplus land.

Even dedicating land to inedible bioenergy feedstocks, such as grasses or trees, is inadvisable from a climate standpoint because the land used still has an opportunity cost. Biofuels from perennial energy crops, such as switchgrass, miscanthus, and willow trees, would have some advantages

over food crops because they use less fertilizer and appear to sequester some soil carbon. But their land-use requirements are likely to be similar (after accounting for food crop by-products). Even if land becomes available, and even using highly optimistic technical assumptions, such "second-generation" biofuels still fall far short of achieving carbon-neutral energy when factoring in the opportunity costs of land.

In the case of using wood for power or heat, multiple studies have shown that harvesting wood, instead of leaving trees unharvested in the forest, will increase net emissions in the atmosphere for decades to centuries, even when replacing coal or natural gas. These studies have analyzed these wood uses in a wide variety of scenarios, including scenarios with the wood coming from different forests, using different harvesting systems, having different ultimate energy uses, and replacing different fossil fuels. The result always has the same bottom-line result: producing any meaningful quantity of bioenergy (even from inedible feedstocks) greatly exacerbates competition for land and has high carbon costs.

Land Demands for Wood Construction

From a climate perspective, using wood for construction has obvious advantages over burning it for bioenergy but still has high costs. The advantage occurs because the portion of the tree stored as wood in buildings persists, storing its carbon and keeping it from the atmosphere for years. However, only some of the wood affected by forest harvest is stored, and only for some time. Much of the wood and other vegetation affected is lost through the decay of roots and some tops, branches, and bark from harvest residues. Typically, between 40 and 50 percent of wood sent to sawmills or paper mills is burned as waste, and much harvested wood is used for more temporary products such as paper.

Under a scenario of significant increase in mass timber use, the areas and quantities of additional wood harvested could be large. For example, providing 10 percent of the world's new urban construction material from wood between 2010 and 2050 would require 50 Mha of secondary forest (in clear-cut equivalents). Providing 50 percent of new urban construction material from wood between 2010 and 2050 would require harvesting an additional 200-250 Mha of secondary forest.

The Carbon Implications of Wood Construction Expansion

Most published analyses that find climate benefits from mass timber assume that wood is carbon neutral so long as wood is harvested sustainably, which we consider incomplete. We analyzed 60 published studies with conflicting scientific claims. We found that the vast majority of the studies that find net climate benefits from mass timber in construction—such as the incomplete bioenergy studies—assume that all wood is carbon neutral, which means that the carbon lost from the forest and emitted to the air when wood is burned or decayed is not counted. These studies come in different varieties. Some not only ignore these releases of carbon but count all the carbon stored in forests used to supply wood as part of the benefit, presumably on the theory that those forests would not exist without these wood uses and that the harvested land would otherwise generate no other climate benefits. This is the same assumption used to justify using wood for bioenergy and is incorrect for the same reason discussed above.

A limited number of published studies have analyzed the climate implications of mass timber using what we call the all-carbon-pools approach—a climate analysis that tracks the quantity of carbon stored in various uses as they change over time. These "pools" include carbon in live vegetation in the forest, carbon in roots and slash left behind to decompose in the forest, carbon in wood products, and carbon in landfills. Any carbon lost from the forest but not stored in another pool is by definition lost to the atmosphere. These all-carbon-pools analyses—like other analyses of the climate benefits of wood in construction—can also calculate the "substitution" benefits of using wood to replace concrete and steel. These studies generally have found that most wood harvests increase carbon in the atmosphere for many decades if they assume the typical real-world distribution of the harvested wood into furniture, construction, paper, and

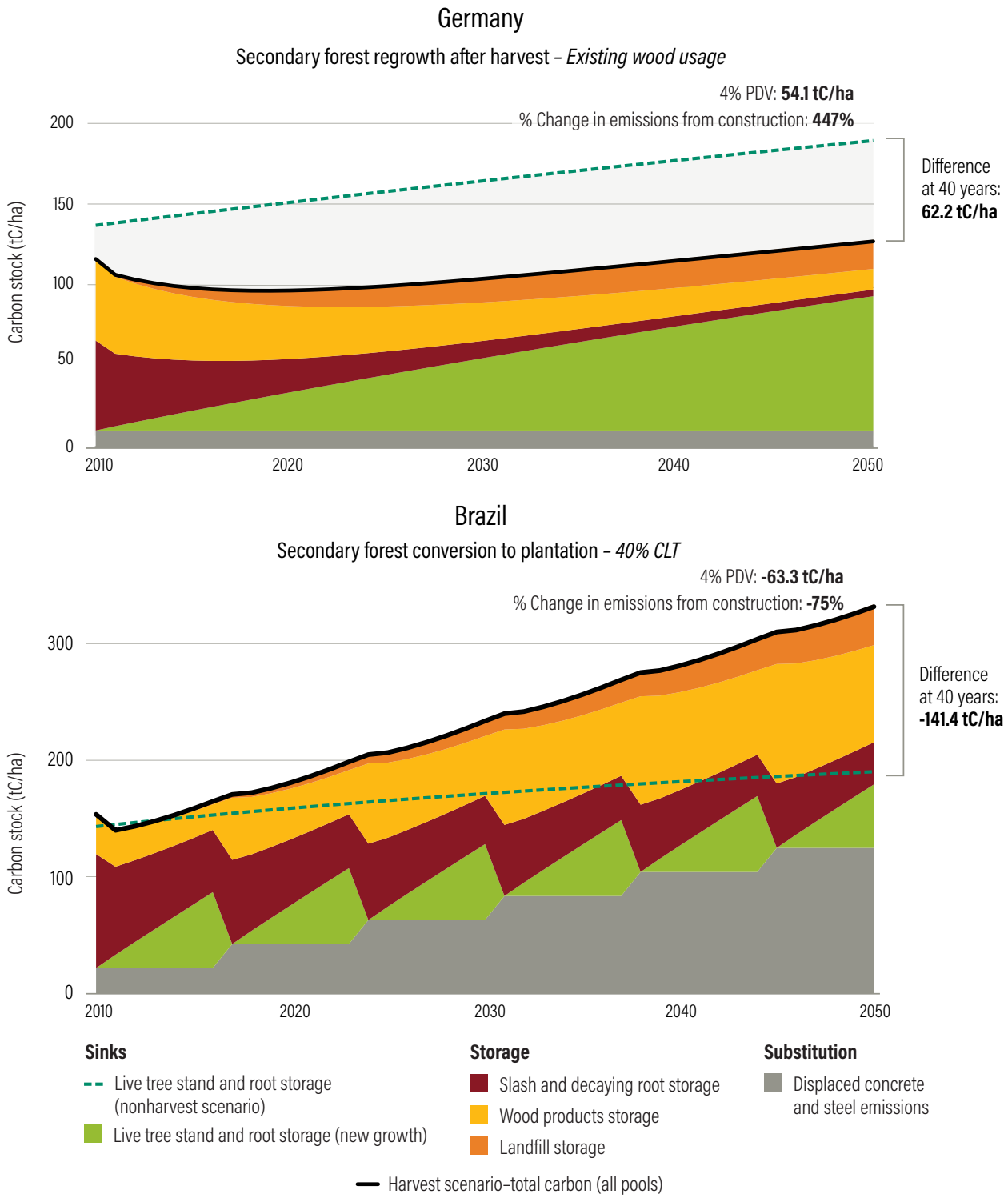
energy. Based on observations to date, only a small percentage of the harvested wood actually substitutes for steel and concrete.

Some studies have found that if forests are harvested with relatively low slash rates, and if a very high percentage of harvested wood is turned into a construction product that substitutes for concrete and steel, the harvest and use can generate GHG benefits within a few decades or sometimes even immediately. Assumptions about several parameters, such as the percentage of wood used for construction, the substitution value, and forest growth rates, significantly influence these results.

To explore the potential implications of wood supply and demand scenarios on land use and the climate in more depth, we applied CHARM to a range of different scenarios. Although other papers have used a similar all-carbon-pools approach, CHARM can summarize the change in carbon over time using a single, time-discounted number. We also calculate the undiscounted net result after 40 years, which typically turns out to be similar. The analysis first generates the effect on GHG emissions per hectare of wood harvested. Figure ES-4 shows how carbon flows between different pools after harvest, the present discount value of the changes, and the absolute change in carbon after 40 years.

CHARM also adds another calculation that is nearly always left out of other papers: the net percentage change in emissions from construction materials when wood is used to replace concrete and steel. This percentage-change calculation is common in other climate contexts, such as comparing a renewable energy source versus a fossil fuel. In policy analysis, it is important for many reasons. For example, a reduction in emissions substantially less than 100 percent would suggest the need to pursue additional solutions. Such emissions reductions might also be eliminated if progress is made in reducing emissions from the "conventional" activity—in this case, the production and construction use of concrete and steel. Furthermore, a finding of a small emissions reduction might also justify less attention and resources devoted to the use of mass timber, particularly since other environmental and social costs, such as biodiversity loss, are not included in the climate analysis. In the scenarios in ES-4, one results in a 447 percent increase in construction emissions while the other results in a 75 percent decrease.

Figure ES-4 | CHARM Model Analysis of Changes in Carbon Pools and Carbon Consequences of Wood Harvest and Use Scenarios



Notes: **PDV:** present discount value of carbon cost per hectare. When the PDV per hectare is positive, there is a net disadvantage to the wood harvest scenario; when negative, there is a net carbon benefit to the wood harvest scenario. **% Change in emissions from construction:** the net percentage change in emissions from construction materials when wood is used to replace concrete and steel. **Difference at 40 years:** the difference at 40 years from the first harvest between the nonharvest scenario carbon stock (green dashed line) and the harvest scenario carbon stock (black line). **Existing wood usage:** a supply scenario where the wood is harvested and follows the existing patterns of wood use. **40% CLT:** a supply scenario where 40% of the wood is used as construction timber that replaces steel and concrete.

Source: Carbon Harvest Model.

Our analysis of wood harvest scenarios for construction (Table ES-2) roughly confirms the implication of other studies that count all carbon pools:

- So long as additional wood harvests follow existing patterns of wood use, an increase in the harvesting of secondary forests for construction use is likely to result in a net increase in GHG emissions, even when accounting for the effects of substituting wood for concrete and steel. One reason is that only a small proportion of harvested wood (and therefore the forest carbon lost due to increased wood harvesting) is typically incorporated into a long-lived wood product and stored in buildings. If we assume that 40 percent of wood harvested will be used to replace concrete and steel, the results are still adverse.
- In some warm, wet regions, converting secondary forests to plantations could result in more favorable climate results if 40 percent of the wood harvest could be used to replace concrete and steel. For forests in Indonesia, construction material savings of 24 percent would be possible, and that would rise potentially to 75 percent in Brazil (if technology can evolve to use its plantation wood). Using existing plantations in Indonesia and Brazil could generate larger savings of roughly 70 percent and 110 percent, respectively. But all this plantation wood is already needed to meet other wood needs.
- Studies have estimated the effects if 70 percent of wood harvested were turned into construction material, so we analyze this scenario as well, although we doubt it would be technically feasible. If this is possible, and with a significant substitution benefit, many harvests could produce small net percentage savings, such as 18 percent in Germany. In a few examples using plantations, savings could be high, reaching 65 percent when natural forests are converted to loblolly pine in the southeastern United States and reaching 95 percent for conversion of natural forests to plantations in Brazil.
- If agricultural land is abandoned and at least 40 percent of wood harvested can be used to replace concrete and steel, we find that fast-growing tropical forest plantations can be more beneficial for the climate than simply allowing these secondary forests to regrow. To avoid clearing more land elsewhere, however, these opportunities require overall measures to reduce the need for agricultural land. In addition, unless the first use of such plantations would be to meet rising demand for other wood uses, using them to meet additional demand to replace construction would require harvesting more wood from natural forests, making them the true source of the wood.

Table ES-2 | Percentage change in emissions when harvesting wood for construction versus using concrete and steel (selected wood harvest scenarios)

WOOD USAGE SCENARIO	EXISTING WOOD USAGE	40% WOOD FOR MASS TIMBER	70% WOOD FOR MASS TIMBER	EXISTING WOOD USAGE	40% WOOD FOR MASS TIMBER	70% WOOD FOR MASS TIMBER
SUBSTITUTION FACTOR	**0.44 tC/tC**			**1.2 tC/tC**		
U.S. Pacific Northwest Hemlock-Sitka spruce						
Secondary forest and regrowth	+1,419	+235	+73	+622	+59	-18
Secondary forest and conversion to plantation	+1,299	+207	+56	+565	+46	-26
Existing plantation	+1,121	+162	+29	+480	+24	-39
U.S. Pacific Northwest Douglas Fir						
Secondary forest and regrowth	+1,532	+263	+88	+676	+72	-11
Secondary forest and conversion to plantation	+1,386	+228	+68	+606	+56	-20
Existing plantation	+1,101	+157	+27	+471	+22	-40
U.S. Southeast Oak-hickory						
Secondary forest and regrowth	+898	+111	+1	+374	0	-52
Secondary forest & conversion to loblolly plantation	+709	+65	-26	+285	-22	-65
U.S. Southeast Loblolly-shortleaf pine						
Existing plantation	+653	+50	-35	+258	-29	-69
Brazil						
Secondary forest and regrowth	+1,203	+162	+40	+519	+25	-33
Secondary forest and conversion to plantation	+303	-47	-89	+92	-75	-95
Existing plantation	-77	-128	-136	-89	-113	-117

Table ES-2 | Percentage change in emissions when harvesting wood for construction versus using concrete and steel (selected wood harvest scenarios) (cont.)

WOOD USAGE SCENARIO	EXISTING WOOD USAGE	40% WOOD FOR MASS TIMBER	70% WOOD FOR MASS TIMBER	EXISTING WOOD USAGE	40% WOOD FOR MASS TIMBER	70% WOOD FOR MASS TIMBER
SUBSTITUTION FACTOR	0.44 tC/tC			1.2 tC/tC		
Indonesia						
Secondary forest and regrowth	+609	+269	+110	+237	+75	0
Secondary forest and conversion to plantation	+182	+61	-26	+34	-24	-65
Existing plantation	-33	-32	-81	-68	-68	-91
Germany						
Secondary forest and regrowth	+1,050	+231	+72	+447	+57	-18
Secondary forest and conversion to plantation	+1,005	+219	+65	+425	+51	-21
Existing plantation	+1,696	+395	+165	+754	+135	+26

Source: Carbon Harvest Model.

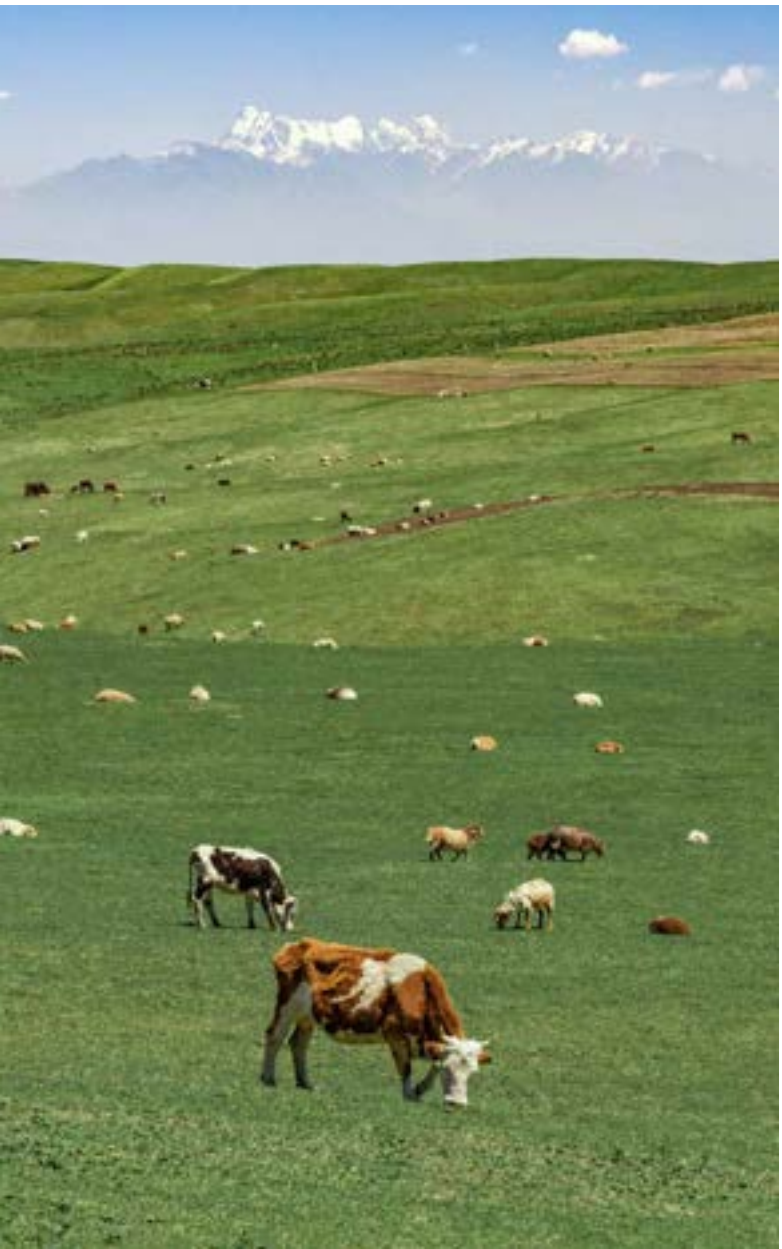
Although many of the estimates and assumptions that go into our calculations have significant uncertainties and would benefit from improved data and analysis, we believe the broad implications of this analysis are likely to remain valid. Among the scientific organizations in agreement is the European Commission's Joint Research Centre, which has concluded that the "material substitution" benefits of harvesting more wood are likely to be less than the costs in reduced forest carbon storage "even assuming the highest substitution values." (Grassi et al. 2021).

Produce, Protect, Reduce, and Restore: Potential Solutions to Reduce Land Competition

Avoiding harsh impacts on climate and biodiversity from the global land squeeze requires strategies to produce, protect, reduce, and restore. The overall strategy is to meet human needs for food, wood, and shelter while reducing the demand for land for human uses and increasing the costs of converting natural lands to those uses. This strategy means *producing* more food and wood on the same land while encouraging denser cities; *protecting* forests and other natural ecosystems; *reducing* demands for land-intensive foods, wood, and other products; and *restoring* forests and other native habitats where few land-based products are produced, where there is a high biodiversity need, or if agricultural land use can be reduced in the future.

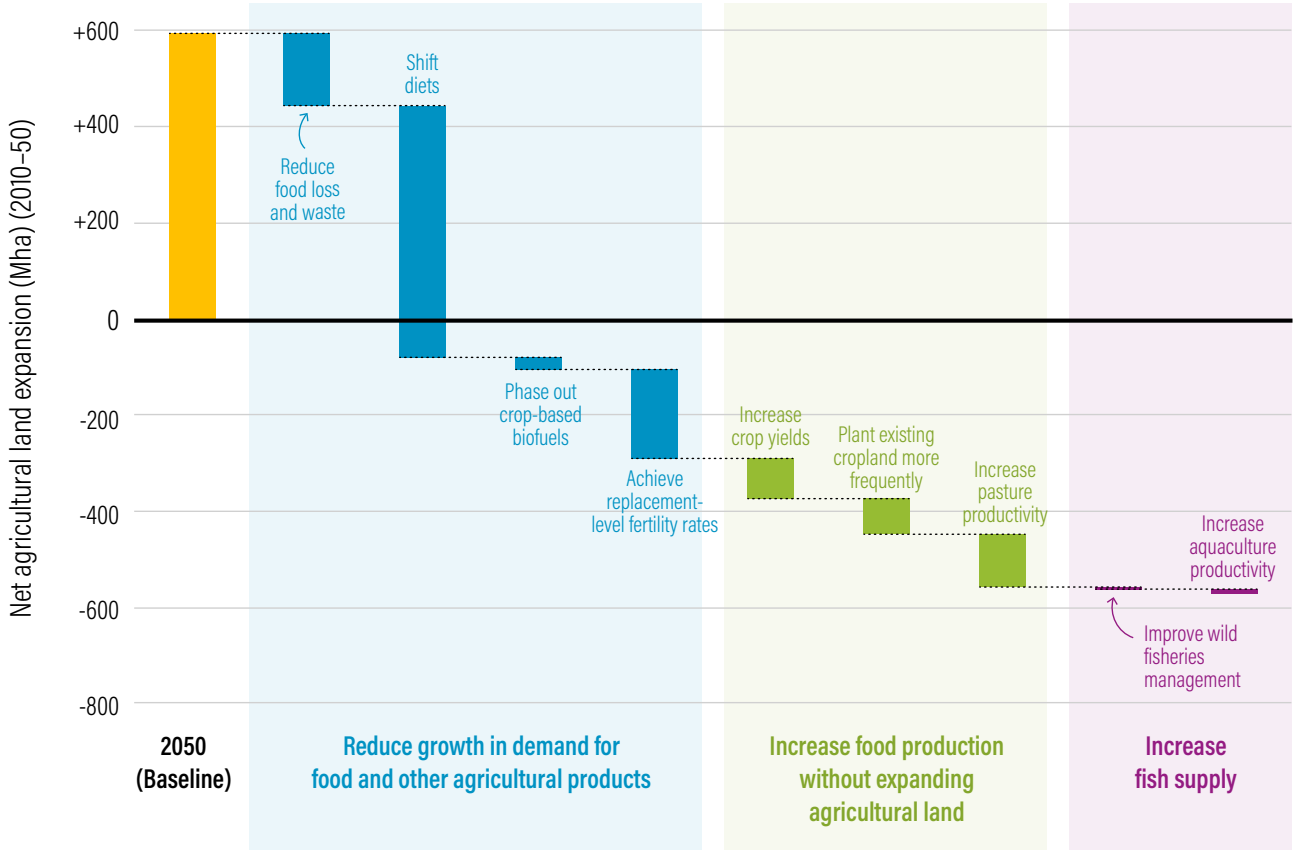
- For agriculture, this strategy involves dramatically increasing crop and grazing yields. It also means reducing food loss and waste and consuming less land-inefficient foods (for example, by shifting diets away from meat and milk, especially beef, towards plant-based foods). Productivity gains should be explicitly linked with efforts to simultaneously protect and restore forests and other natural areas.

- Vast changes are necessary just to avoid further clearing of forests and other natural ecosystems. With massive improvements in all these measures—at the outer edges of what might be technologically and politically feasible by 2050—reducing agricultural land area by 800 Mha between 2010 and 2050 is conceivable (Figure ES-5). Achieving such a goal could free up some lands for both natural forest restoration and forest plantations in a sustainable food and forest future.
- For urban areas, the needs are for a variety of policies to concentrate development.
- For wood products, strategies to reduce consumption include expanded recycling and reduced use of materials for packaging, more efficient wood-burning stoves, and transitions to solar-based electric heating systems in developing countries. This includes using more existing wood harvests for longer-lived uses and then making cascading uses of the wood for shorter-lived purposes. Despite the high environmental costs of plantation forests, there is also a case for providing more of the world's wood from plantations because it would reduce the need to harvest from natural forests. And where natural forests are harvested, a key need is to reduce the large quantities of vegetation destroyed for each ton of wood harvested in tropical forests and to avoid extending roads that open up new areas for harvesting.



- At this time—because the world has not yet demonstrated it can peak and reduce demand for land-based products—any policies that would further increase demand for land-based products should be avoided. This principle is true whether those additional demands are for bioenergy (from sources other than wastes) or increased wood for construction. These expanded uses have the potential to dramatically escalate land-use competition, potentially increasing overall human uses of land several-fold and greatly increasing pressure on the world's remaining forests and other natural ecosystems. When factoring in the opportunity costs of land, these land uses will also typically increase emissions in at least the medium term (through 2050).
- Despite the need for land for human uses, some lands in agricultural use should be restored to natural ecosystems either because of their large carbon costs, such as drained peatlands, or their limited food production combined with high potential for carbon and biodiversity benefits. Examples of the latter include highly sloped tropical pasture lands that can be restored to tropical forests.
- In the future, if strategies to produce, protect, and reduce are highly successful and agricultural land demand is reduced, there are multiple potential competing uses of that "liberated" land, ranging from reforestation and other forms of habitat restoration to bioenergy to timber plantations for construction. These competing uses can be evaluated at that time based on what will likely be new information on the efficacy and alternatives to each.

Figure ES-5 | An ambitious menu of food solutions could theoretically reduce agricultural land demand by 800 million hectares while feeding 10 billion people in 2050



Source: GlobAgri-WRR model in Searchinger et al. 2019.

1. Introduction

The world faces a "global land squeeze" due to rising competition for land. This competition exists between growing demands for land to supply human consumption of plant material—whether for food, wood, or industrial products—and land uses to store carbon and provide habitat in forests, savannas, or some other form of relatively native vegetation.

Already today, nearly half of all vegetated land is in some kind of agricultural use, and 60–85 percent of forests are at least occasionally harvested or manipulated by people in some other way (Erb et al. 2007, 2018; Shukla et al. 2019). As the global population grows to 10 billion people by 2050 (UNDESA 2019a), incomes rise, and the world seeks to make progress against the Sustainable Development Goals (UNDESA n.d.), competition for finite land resources is intensifying.

Growing demands for land to supply products for human consumption pose a major challenge to the climate and biodiversity. Land-use change, including reductions of wood and therefore carbon in remaining forests and savannas, likely has contributed one-quarter to one-third of the carbon that human beings have added to the air (Le Quéré et al. 2016). Habitat loss from the conversion to agriculture and forestry has been the single dominant driver of biodiversity loss (Pimm et al. 2014). Although urban areas occupy a much smaller percentage of land than agriculture and forestry, the projected growth of urban areas in coming decades significantly adds to the land-use challenge; two-thirds of the global population is likely to live in cities by midcentury, up from 55 percent in 2018 (UNDESA 2019b).

Even as these pressures to increase food production, wood use, and urban areas threaten natural habitats, many proposed strategies for addressing climate change make additional demands for land, such as using more biomass for energy and more wood to replace concrete or steel in construction. At the same time, competing climate strategies, often the core of "natural climate solutions," call for not only protecting remaining forests but also restoring large areas of forest.

How vast is this land use competition? This paper examines the scope of the combined land-use challenges and their implications for carbon and biodiversity.

- Section 2 looks at recent land-use trends and their effects on carbon and biodiversity. For carbon in particular, this section explains the different ways of tracking land-related carbon emissions and what we do and do not know.
- Section 3 projects land demands and carbon implications for agriculture, urban expansion, and forestry. For agriculture and forestry, we provide projections from our own biophysical models and put those projections in perspective with other researchers' estimates. We examine different scenarios: business-as-usual (BAU), high- and low-demand, and scenarios with different sources of supply. The purpose is to provide a "first-order" sense of the challenges and to examine the relative significance of possible changes in demand for and supply of land-based products.
- Section 4 examines some potential implications of climate-related policies that would increase land demands, including bioenergy and long-lived forest products.
- Section 5 examines more deeply the climate consequences of using wood for construction, given competing demands for land, and explores different wood demand scenarios and assumptions.
- Section 6 offers guiding principles for addressing these challenges, including some overall scenarios that could preserve and even restore existing natural areas.

One theme that emerges from this analysis is that climate and biodiversity strategies have frequently failed to appreciate both the scope of global land use competition and the even more basic fact that no use of land is "free" from the perspective of carbon or biodiversity. Solutions that benefit the climate and protect biodiversity require reducing the demand for land for human purposes. Given growing demands for all human land uses, and a fixed area of land, successful protection and restoration of natural ecosystems means both more land-efficient consumption and more land-efficient production. People must try to consume foods and forestry products that require less land, and people must produce more of those products on each hectare of land they use.

2. Global Land-Use Change, Recent Trends, and the Effects on Carbon and Biodiversity

The world has a fixed area of total land that, excluding Antarctica, amounts to 13.3 billion hectares (Bha). Of that, 22 percent is barren or sparsely vegetated (i.e., covered by ice, desert, or almost desert). Another 2 percent consists of rivers and lakes, and around 1 percent is in urban use. That means about 75 percent of the world's land (about 10 Bha) is vegetated.

2.1 Global Land Use Today and the Historical Effects on Carbon

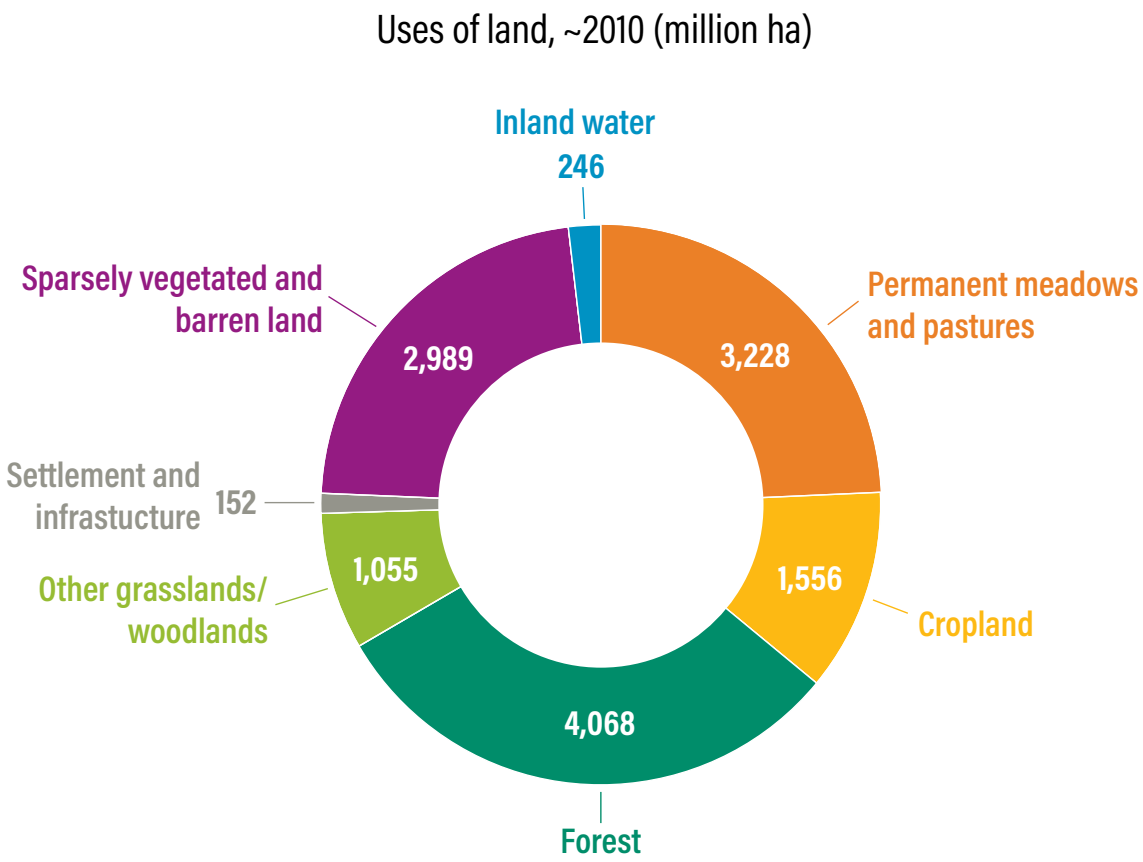
People heavily manipulate the vast majority of the world's vegetated land (Figure 1). Around half has already been converted to agricultural use (probably around 5 Bha depending on different pasture definitions and estimates; Fetzel et al. 2017; Searchinger et al. 2019). Two-thirds of that agricultural use is pasture, and one-third is cropland. According to one estimate, agricultural land area grew by more than 40 percent between 1850 and 2015 (Houghton and Nassikas 2017).

This expansion of agriculture has led to vast losses of forests and native grasslands. Primarily as a result of agricultural expansion, the world has lost 35 percent of its forests (Watson et al. 2018).

Between 1700 and 2000, the world also converted to cropland or otherwise heavily transformed more than 90 percent of its native grasslands (Shukla et al. 2019) and more than 80 percent of its shrublands (Ellis et al. 2010). The rate of loss has also accelerated. According to the Food and Agriculture Organization of the United Nations (FAO), just between 1990 and 2020, global forest area declined by 420 million hectares (Mha), or roughly 10 percent. That 1990–2020 forest loss included 81 Mha of primary forests, which FAO defines as forests with little sign of human impact (FAO 2020b).

Most of the remaining areas are also manipulated by humans. Estimates are that 60–85 percent of forests are regularly manipulated by human uses in the form of harvests or changed plantings, and that is also true of 70–90 percent of woody savannas (Shukla et al. 2019).

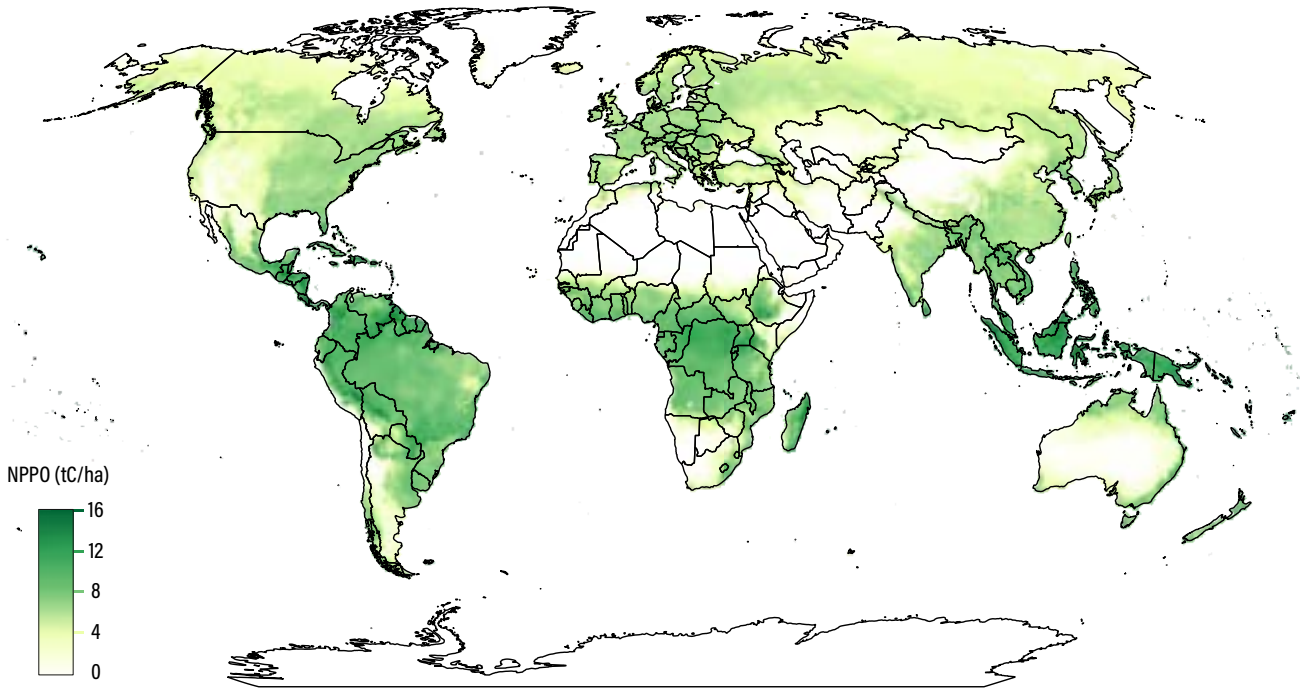
Figure 1 | The Global Land Budget



Source: FAO 2011; GlobAgri-WRR model in Searchinger et al. 2019.

One way to measure the limited productive capacity of managed land is to estimate the likely potential carbon absorbed into aboveground vegetation each year by plant growth (or net primary productivity) if native plants still covered the planet. These estimates are in the range of 65 gigatons of carbon (GtC) per year (Haberl et al. 2007) and vary greatly across the landscape, as illustrated by Figure 2. Although there are limited locations in which human activity has increased total plant growth versus native vegetation, mainly through irrigation, human activity has overall reduced total plant growth per year (Haberl et al. 2007), with more recent estimates placing actual plant growth at around 55 GtC per year (Running 2014). Each year, people directly consume almost 25 percent of this plant-productive potential by harvesting it as crops or wood, feeding it to farm animals, or reducing total plant growth, and human activity also greatly alters most of the remainder (Haberl et al. 2007). Although humanity has greatly increased the efficiency with which it uses land since 1900 (Krausmann et al. 2013), most notably by increasing crop yields, the global capacity to produce plants is a highly limited, although not entirely fixed, resource.

Figure 2 | The world's potential to generate plants is roughly represented by the carbon in native vegetation



Note: NPP0 = net primary productivity of native vegetation.

Source: Calculations using Lund-Potsdam-Jena managed Land model (LPJmL) and reproduced from Searchinger, Wirsenius, et al. 2018.

Land-use changes have been a major cause of global warming. The estimate that historical land-use change is responsible for one-quarter to one-third of the carbon human activity has added to the air since 1750 (Le Quéré et al. 2018) may even be an underestimate. It is based on estimates of total cumulative losses from land conversion and wood harvests of roughly 150 GtC from studies that use so-called bookkeeping methods, such as Houghton and Nassikas (2017).[1] Another recent paper estimated a much larger mean figure of losses of 450 GtC from soils and vegetation (Erb et al. 2018). Although its estimates of conversion due to agriculture were similar to the smaller estimates, it estimated far higher losses due to forest harvests or native vegetation loss in savannas and shrublands.

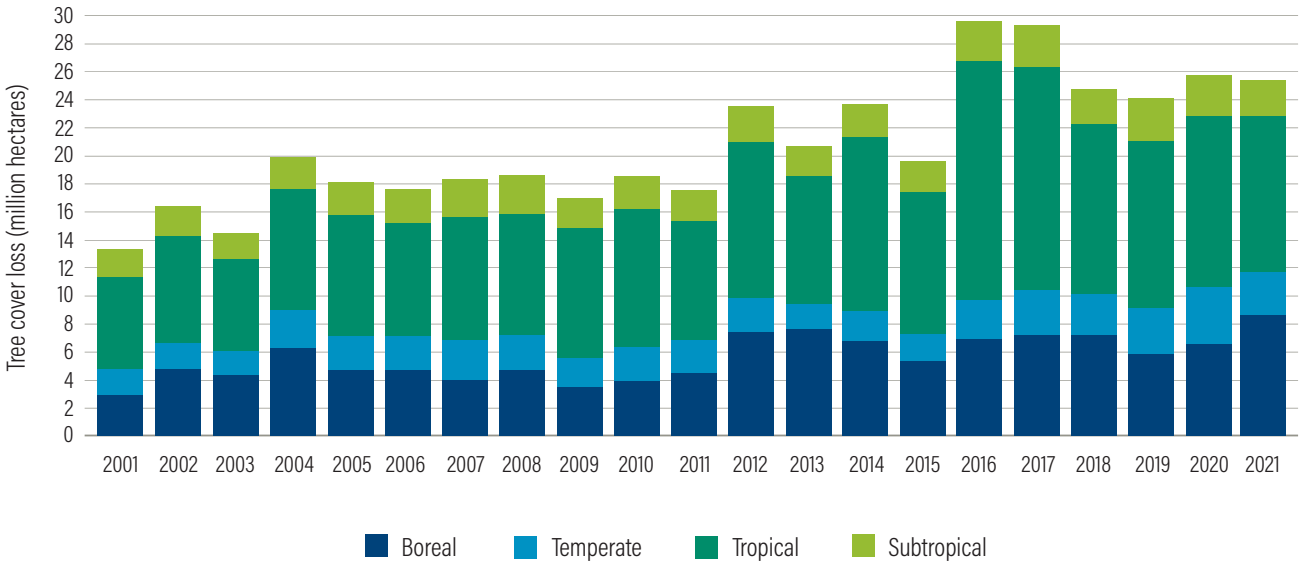
2.2 Ongoing Land-Use Change

Greenhouse gas (GHG) emissions and biodiversity loss from land-use change are ongoing. The different ways of counting this change, and the different meanings of *land-use change* can be confusing. As used by both the Intergovernmental Panel on Climate Change (IPCC) and this report, the term *land-use change* includes both conversions of land permanently to another use and changes, such as forest harvests, that affect carbon storage on land remaining in the same basic use. The overall evidence supports high levels of both gross land-use change and net land-use change. And the difference between gross and net land-use change, which represents shifts in where agriculture occurs, presents its own climate and biodiversity challenges.

2.2.1 Evidence of gross and net forest loss

One form of land-use change arises from the gross loss of forest cover; this refers to the total area of land covered with forest that is cleared for one reason or another. By this measure, human activity was responsible for roughly 15 Mha of gross forest clearing per year from 2001 to 2015 (Curtis et al. 2018), with another 5 Mha due to forest fires. The immediate drivers of this clearing were almost evenly divided between large-scale agriculture, small-scale agriculture, and forestry. Gross deforestation (defined here as tree cover loss, whether permanent or not) has been growing, rising from an average of roughly 15 Mha in 2001–03 to 26 Mha in 2017–21 (Global Forest Watch 2022; Figure 3).

Figure 3 | Gross forest cover loss has averaged 20 Mha per year since 2001



Source: Global Forest Watch 2022.

However, the 20 Mha per year of gross deforestation does not account for areas that reforest. Determining net deforestation is challenging because there have yet to be satisfactory methods of counting net changes globally using satellites. Relying instead on country-reported area changes, FAO reports an annual net loss of 8 Mha of natural forests between 2010 and 2020 and a net annual increase of 3 Mha of planted forests for a net total annual loss of 5 Mha (FAO 2020b). The FAO analysis does not count clear-cuts of forests as forest losses if those forests will be allowed to regrow.

2.2.2 Evidence of other native habitat loss

In addition to forest loss, woody savannas and other native habitats are likely declining. Global Forest Watch (2022) does not count a variety of woody savannas (with less than 30 percent tree canopy cover). There is no global assessment of nonforest lands converted to agriculture, but there have been assessments of loss in particular areas. For example, studies have found large areas of savanna loss in the Brazilian Cerrado (Beuchle et al. 2015; Rausch et al. 2019) and even recent conversion of native prairie in the U.S. Great Plains (Hong et al. 2021; Lark et al. 2015; Molinario et al. 2017; Popp et al. 2014; Wright et al. 2017). Data from both FAO (2020a) and Potapov et al. (2022) suggest that Nigeria has had millions of hectares of agricultural land expansion over the last decade, but only 1 Mha of that land expansion could be explained even by gross forest cover loss, probably because it is occurring in savannas.

2.2.3 Expansion of agricultural area

Mirroring the gross and net losses in forest cover are gross and net increases in agricultural land area. Although satellite data and self-reported country data contain some discrepancies explained by methodological differences and challenges in definitions and reporting, it is clear that large-scale gross agricultural expansion is ongoing and significant net agricultural expansion is occurring, although the amount of net expansion is more uncertain (Box 1).

One important recent study by Potapov et al. (2022) provides evidence that not only gross but also net agricultural land is expanding at a high, accelerating rate. The Potapov study tracked annual cropland changes by carefully training high-resolution satellite data. It estimated that the net expansion of cropland grew from 5.1 Mha per year in 2004–7 to 10.0 Mha per year in 2012–19. To put this figure in perspective, it is roughly six times FAO's reported expansion of annual cropland during this period. Because separating permanent croplands such as tree crops from natural lands is much less reliable, this study could only count annually cropped land. In addition, FAO estimates roughly a 1.0 Mha per year expansion of permanent cropland, such as oil palm, coffee, and rubber, and the Potapov study finds some support for that type of expansion. The combination would bring recent net cropland expansion up to 11.0 Mha per year.

Net changes in pasture are even harder to estimate, but as discussed in Box 1, the evidence of gross pasture expansion into forests is clear; likewise, strong satellite evidence is emerging that clearing of woodland and forests for pasture is also occurring at a large scale on a net basis. Put together, despite significant uncertainties, the evidence suggests that agricultural land is expanding at a very high and likely expanding rate.

Put together, despite significant uncertainties, the evidence suggests that agricultural land is expanding at a very high and likely expanding rate.

BOX 1 | Assessing Agricultural Expansion

Papers such as Curtis et al. (2018) use satellite images to estimate the gross conversion of forests to agriculture.[a] Curtis et al. estimate that roughly 10 million hectares (Mha) have been converted per year in recent decades, but these estimates do not fully estimate net agricultural expansion. On the one hand, estimates of forest cover loss underestimate agricultural expansion because they do not include large-scale conversion of savannas to agriculture. On the other hand, they overstate net losses of forest because they do not assess the abandonment of agricultural land (and reversion to forest).

Data from the Food and Agriculture Organization of the United Nations (FAO), which mostly rely on self-reporting by countries, ideally should count all gross and net changes. FAO reports that cropland area has been expanding in recent years. However, as discussed in *Creating a Sustainable Food Future*, the precise quantities are not reliable. FAO has reported large increases in "harvested area" in recent years (e.g., increases of 15 Mha/year between 2002 and 2016), but reported increases in "cropland" of only 4 Mha/year during this period. Of that cropland, moreover, roughly half is permanent crops such as oil palm, and only 2 Mha/year are in annual crops. In theory, both estimates could be accurate because there is a difference between "harvested area" and "cropland" as defined by FAO. Harvested area counts the number of harvests that occur in a year, so if a hectare is harvested twice in a year, it counts as 2 hectares of harvested area. For this reason, if the quantity of land harvested twice per year increases (double cropping), or if croplands are left fallow in fewer years, harvested area could increase without an increase in total area used for cropland. However, using more detailed sources for some countries in *Creating a Sustainable Food Future*, we did not find that enough increases in double cropping or decreases in fallow land to justify these differences in FAO estimates of harvested area and cropland. Underlying these problems is the large uncertainty in national reports of cropland area, which is matched by significant variations, even in estimates by different satellite studies.

As discussed in the main text, a recent study by Potapov et al. (2022) now provides strong evidence that annual cropland is expanding at a far higher rate than estimated by FAO cropland data.[b] It found a net expansion of 10 Mha/year between 2013 and 2019, roughly six times the FAO estimates for those years. When combined with FAO estimates of permanent crop expansion, that brings the total to 11 Mha/year. It also found that gross expansion was roughly twice the rate of net expansion. This gross expansion is significant because even if other land is restored—and Potapov et al. found only some land regrew some kind of native vegetation in this period—the exchange still likely results in a greater loss of carbon and biodiversity and an increased quantity of carbon in the atmosphere for many years.

Assessing changes to net pasture area remains somewhat confusing, but the evidence is strong that vast areas of forest and woodlands are being converted to pasture on a gross basis. Overall, satellite imagery suggests that most of the conversion of tropical forest is to pasture.[c]

The confusion is due to FAO data. FAO, using country-supplied data, reports a decline of net pasture area between 1976 and 2019. A closer look, however, suggests that this may largely be a matter of definitions; much of the area that was previously reported as "pasture" was very dry or very little used. For example, Australia has reported a decline in pasture between 1976 and 2019 of 155 Mha, reducing reported pasture from 63 percent to 43 percent of the country's land mass. But the great majority of Australia is extremely dry. Australia has essentially been changing its designation of very dry, semidesert. At the same time, pasture is expanding rapidly in the wetter areas. One recent paper, using very detailed satellite imagery, found a conversion of 0.6 Mha of woodland to pasture in just one state in Australia (Queensland) in just one year (2018–19).[d] Similarly, Brazil has reported to FAO a 6 Mha decline in pasture between 1985 and 2018, but a new report using satellites finds a net increase in pasture of 55 Mha during this period.[e] The difference is likely because Brazil has long reported native Cerrado and similar vegetation as grazing land even though it is only occasionally grazed whereas satellite images can capture the clearing of the woodland and the transformation into truly managed pasture. In other words, the satellite imagery seems to show that vast areas of woodland and forest are being converted to pasture on both a gross and net basis.

Overall, the picture that emerges is of vast agricultural expansion at rates that even appear to exceed prior model projections cited in the main text.

Sources: a. Curtis et al. 2018; b. Potapov et al. 2022; c. Gibbs et al. 2010; Graesser et al. 2015; Weisse and Goldman 2021; d. Queensland Government 2021; e. Parente et al. 2021.

2.2.4 Shifting agricultural land

The difference between gross and net agricultural expansion represents the different ways in which the location of the world's agricultural land can shift from one location to another. Some agricultural shifting can be characterized as traditional swidden agriculture, sometimes known as slash-and-burn agriculture. In this system, farmers rotate agriculture among neighboring fields over several years to allow fields to replenish their nutrients. But even where farmers practice swidden agriculture, deforestation is still occurring overall because swidden agriculture is expanding into new forested lands (Molinario et al. 2017). In addition, swidden agriculture is shifting to shorter-term rotations, which means that on average even preexisting swidden landscapes store less carbon. For example, although there is evidence that much of the new agricultural land in Africa will later be abandoned and rotated as part of swidden agriculture (Curtis et al. 2018), the evidence shows that this swidden agriculture in Africa, and therefore overall agricultural land, is expanding rapidly (Potapov et al. 2022).

Shifting agricultural land from one place to another is also occurring over larger areas than just one farm. Within regions (e.g., Latin America) and countries (e.g., the United States), studies have found agricultural land expansion occurring in some areas while agriculture is being abandoned and forests are recovering in other areas (Aide et al. 2013; Lark et al. 2015; Lindquist et al. 2012; de Sy et al. 2015). This shifting could be encouraged by land-use degradation but also by new roads, crop varieties, and increased mechanization, which can make farming new lands more economical than prior lands. For example, in the first decade of the 21st century, there appeared to be a general shift from higher elevation and drier lands in Latin America towards wetter, flatter lands (Aide et al. 2013). On a global scale, FAO and other data show that agricultural lands are also shifting from the Global North to the Global South (Searchinger et al. 2019). This global shift will likely continue partially because the bulk of future food demand growth is likely to occur in the Global South. In addition, this global shift represents a shift in the economics of where to profitably produce food. This shifting means that reforestation in some countries is related to deforestation in others.

China provides a good example of recent shifts in agricultural land demand. Through deliberate policies, China has reforested roughly 30 Mha of mostly hilly land in western China (Hua et al. 2016) and 70 Mha of the country overall since 1973, primarily in forest plantations (Zeng et al. 2015). However, beginning around 1995, China froze its domestic production of soybeans at around 10–15 million tons, even as its meat production and need for soybean-based feeds greatly expanded. By 2017–19, Chinese soybean imports reached an annual average of 95 million tons. Assuming these imports come only from high-yielding countries, that level of import demand represents a need for roughly an additional 30 Mha of soybean production in foreign countries, primarily in Latin America. (In 2019 and 2020, China bought 4 percent of soybeans produced in the Brazilian Amazon.[2]) China also greatly increased its imports of beef, another extremely land-intensive product, probably using an additional 12 Mha or more of Latin American land.[3] These recent increases in agricultural land to supply soybean and beef imports offset much of the forest areas and carbon sequestration gained by reforesting land in China. Germany and the United Kingdom are other examples of "reforesting" countries whose deforestation associated with imported commodities likely exceeds their reforestation (Pendrill, Persson, Godar, and Kastner 2019).

The shifting of agricultural land locations is significant. On the one hand, it means that reforesting abandoned agricultural land plays an important role in maintaining forest cover because net deforestation would otherwise greatly increase. On the other hand, the trade-off between a gradual regrowth of abandoned agricultural lands and an abrupt clearing of forests and savannas for new agricultural lands is nearly always poor from a carbon and biodiversity perspective (Searchinger, Estes, et al. 2015; Wheeler et al. 2016). Carbon losses occur quickly from conversion of forests to agricultural land in one location while the carbon gains from forest regrowth in other locations occur slowly. In addition, much of the agricultural land expansion is occurring in highly biologically diverse tropical forests even as regrowth occurs in less diverse temperate zones (Chen et al. 2019; Schierhorn et al. 2013)—and often with plantation forests that support little biodiversity (Hua et al. 2016).

2.2.5 Other forms of land-use change

In addition to agricultural land expansion, the growth of plantation forest extent is itself a major change in global land use. For example, assuming FAO statistics are accurate, there has been a net change from natural to plantation forests of roughly 3 Mha per year between 2010 and 2020 and expansion of plantation areas of roughly 6 Mha per year between 2000 and 2015. Growth in agricultural crops such as rubber and oil palm, which together grew by 1.3 Mha per year on average from 2005 to 2019, also commonly appears in satellite imagery as forest growth.

Net changes in land use also do not capture other forms of habitat degradation and related carbon loss. For example, once lands are cleared, there is strong evidence that adjacent lands are degraded by a variety of forces, including hunting, invasive species, water and air pollution, and reduced size of contiguous habitat (Gibson et al. 2011; Haddad et al. 2015; Laurance et al. 2012; Laurance et al. 2014). Forest degradation also occurs from selectively harvesting wood. Selective harvest is the dominant form of forestry in tropical and neotropical areas, which explains why papers tracking forest clearing assign little forest cover loss to forestry in these areas (Curtis et al. 2018). Even in temperate zones, a substantial quantity of forestry is probably not captured by satellite images of forest cover loss. One of the most detailed studies in the United States suggested that for each ton of wood removed in land completely cleared, another ton is removed in areas that satellite images continue to identify as forests (Harris et al. 2016).

2.3 Carbon Implications of Ongoing Land-Use Change

Continuing land-use change through both land conversions and ongoing forestry causes additional carbon losses. In general, conversion of forest or savanna to cropland results in loss of nearly all the carbon in native vegetation and around 25 percent of the carbon in the top meter of soil (Searchinger, Wirsenius, et al. 2018). Conversion to grazing land also results in a large loss of carbon in vegetation, although typically with less soil carbon loss—and in some situations can actually build soil carbon—but recent estimates also indicate large carbon losses from grazing land overall (Sanderman et al. 2017).

As summarized in *Creating a Sustainable Food Future*, typical annual emissions estimates from net land-use change are roughly 4 Gt of carbon dioxide equivalent (CO_2e) from ongoing changes in land use and around 1 $GtCO_2e$ from the continuing degradation of soils in peatlands for a total of 5 $GtCO_2e$ (Searchinger et al. 2019). This estimate is similar to other researchers' estimates of annual land-use change emissions for the past decade, including Le Quéré et al. (2018) and Houghton and Nassikas (2017), and is similar to estimated losses per year over the past 50 years (Friedlingstein et al. 2019). Land-use change is therefore responsible for roughly 10 percent of total annual global GHG emissions (Le Quéré et al. 2018).

Although these estimates include a wide variety of data uncertainties, there are some specific reasons to believe they may be low. They are based on so-called bookkeeping methods that do not factor in a range of carbon losses from land adjacent to forest clearings. One paper estimated that for each hectare of forest cleared, six times as much

carbon is lost on adjacent land due to a variety of disturbances, only some of which could be captured by the standard carbon bookkeeping methods (Maxwell et al. 2019).[4]

These methods of estimating carbon loss also underestimate the effects of "ongoing" forestry activities. In studies typically used by the IPCC, land-use change includes the carbon losses from ongoing forestry, both the wood removed from the forest and the decomposition of the substantial quantities of wood (termed *slash*) that are left to decompose in the forest. These carbon losses are caused by ongoing wood harvests and have been commonly estimated in recent years at somewhat more than 1 Gt per year. But to calculate the net effects of land-use change, these methods also estimate the carbon gains from the regrowth of forest, which nearly offsets the carbon losses from harvesting. Houghton and Nassikas (2017) estimated that regrowth offset 83 percent of the original carbon losses from forest harvests since 1750 and on an annual basis in recent years by roughly 1 GtC per year. To estimate the net effect of both historical and ongoing human activity, this method makes sense. The regrowth of forests from previous harvests would not occur without those previous harvests.

Yet as we discuss in more depth below, regrowth from previous forest harvests is not a result of *present* forest harvests. If all wood harvesting suddenly ceased, the losses of carbon from the world's forests would greatly decline and the recovery of forests from previous harvests would continue, providing a reduction in atmospheric carbon that would continue for many years. Current harvests influence forest regrowth in the future; as forests harvested today recover, the forests will start to take out of the atmosphere the carbon added by the harvests, paying off a so-called carbon debt. Counting recovery from previous harvests as land-use change accurately accounts for past human activity, but it does not accurately represent the consequences of current forest harvests. It understates the effect of current, ongoing harvests. In Section 3, we separately estimate both the gross emissions from harvesting and using wood and introduce a method of simultaneously counting the climate effects of current harvests with future regrowth and with the persistence of some of the harvested wood in wood products.

Beyond the direct effects of land-use change, there is a large increase in the uptake of carbon by global forests and other terrestrial systems through the indirect human effects of increased carbon and nitrogen pollution. Plants are more efficient at photosynthesis when the air from which they draw their carbon has higher concentrations of carbon dioxide, and they also can use water more efficiently by losing less water through transpiration. Plants overall also grow more with increased nitrogen. Fossil fuel combustion and agricultural activities have increased both carbon dioxide and "reactive" nitrogen concentrations in the air, with much of that nitrogen redepositing on the earth, and the two forces together have led to a large increase in forest and possibly grassland growth. This growth can be measured, among other ways, by the faster growth of trees in "intact forests" (Magnani et al. 2007; Malhi 2010), although there is some indication that this growth effect on intact forests is weakening (Hubau et al. 2020). In colder areas, warming allows forests to grow longer. This absorption of carbon is separate from the regrowth of forests due to prior harvests or agricultural land abandonment.

Although uncertain, the best estimates now show that whereas land-use and land cover changes are causing a net increase in atmospheric carbon of around 5 $GtCO_2$/year, absorption of carbon by vegetation is responsible for removing around 12–13 $GtCO_2$/year according to commonly used estimates (Friedlingstein et al. 2019; Li et al. 2016). Although the precise magnitude is uncertain, the effect is both a physical reality and is built into climate models in predicting future change.

Understanding these different flows of carbon into and out of plants and soils is important because the different ways in which researchers "net" one flow of carbon against another can create the impression that some sources of emissions do not "count" or even exist (Box 2). That "netting" in turn can lead to distortions in public policy. These distortions include encouraging policymakers and others to implicitly treat forest harvests as carbon neutral or having limited carbon costs. Netting has also incorrectly conveyed that emissions from land-use change are not occurring in most temperate countries. In our view, each land-use action that increases atmospheric carbon should be judged for its own, separate effects.

BOX 2 | The Implications of Land-Use Netting Approaches for Measuring Carbon Effects of Land Use

Researchers have tended to report their estimated emissions from land-use change in ways that involve some implicit netting of some emissions but not others. Guidance for national inventories from the Intergovernmental Panel on Climate Change (IPCC) also allows some netting. These forms of netting have important consequences.

First, when reporting emissions from land-use change, many researchers tend to report the effects of forestry on a net basis, in which carbon gains from the recovery of forests from prior harvests is netted out against the carbon losses from new harvests. The result implies that present forestry has no (or greatly reduced) carbon consequences even though it has no effect on recovery from prior harvests. A further implication of this approach is that there is no reason to focus climate policy on reducing emissions from forestry, even though doing so would avoid real emissions.

Second, researchers, including the IPCC, often report emissions on a net basis from regions or countries. For example, in a key summary chart in a prominent 2011 paper in *Science*, the authors only reported temperate emissions on a net basis, and they showed a net carbon gain due to reforestation and regrowth of forests from prior clearing.[a] As a result, even though land clearing is still occurring in temperate zones, it is not identified as a source of emissions from land-use change. Instead, the focus is on reducing emissions from land-use change for agriculture in the tropics, and little attention is given to reducing such land clearing in temperate zones.

Third, under IPCC guidance for national inventories, countries are allowed to report the net emissions from all "managed forests."[b] In countries that had heavily cut their natural forests decades ago, including the United States, Europe, and China, that net emissions amount is strongly influenced by the more recent recovery of those previously cleared forests.

That recent regrowth also includes the effect of the carbon dioxide and nitrogen fertilization.[c] IPCC guidance does not allow this netting out of any policy rationale. Instead, the IPCC adopted this rule only because it failed to identify a viable, alternative method for segregating the effect of direct human management after 1990 (when the first climate treaty was signed) from the effects of higher carbon dioxide and nitrogen fertilization and regrowth from pre-1990 forest clearing.[d] In many countries in the Global North, including the United States, virtually all forests are considered to be "managed." This method therefore allows these countries to "take credit" for both forest recoveries from harvests before 1990 and from the effect of carbon dioxide and nitrogen fertilization. For those who are not fully informed, it can create the impression that no activities in the United States are causing land-use change emissions, and perhaps even that U.S. agriculture and forestry activities are a net benefit to the climate.

Sources: a. Pan et al. 2011; b. IPCC 2006; c. Grassi et al. 2018; d. IPCC 2010.

2.4 Biodiversity Effects of Ongoing Land-Use Change

Ongoing land-use change poses grave threats to biodiversity. A major UN report recently found that 1 million species are threatened with extinction (IPBES 2019), a rate of extinction now being called Earth's sixth mass extinction event (Ceballos et al. 2015). There is broad agreement that the main driver is habitat loss due both to permanent land conversion and to the loss of primary forests (IPBES 2019; Pimm et al. 2014). One recent paper found that 80 percent of all threatened terrestrial bird and mammal species are imperiled by agriculture-driven habitat loss (Tilman et al. 2017). Another paper found that bird species with impending extinctions due to land-use activities ranged from 74 to 121 in 2011 (depending on the conservativeness of the estimate), which could nearly double the 140 bird species estimated to have been lost since the year 1500 (Marques et al. 2019). The loss of plant and insect species is even more directly attributable to land conversion.

In addition to agricultural conversion, forestry activities have largely adverse effects on biodiversity. Biodiversity is based on complexity. As forests mature, many tend to develop a diversity of vegetation filling different niches, and it is common for different insect species to evolve to take advantage of these differences. The loss of truly

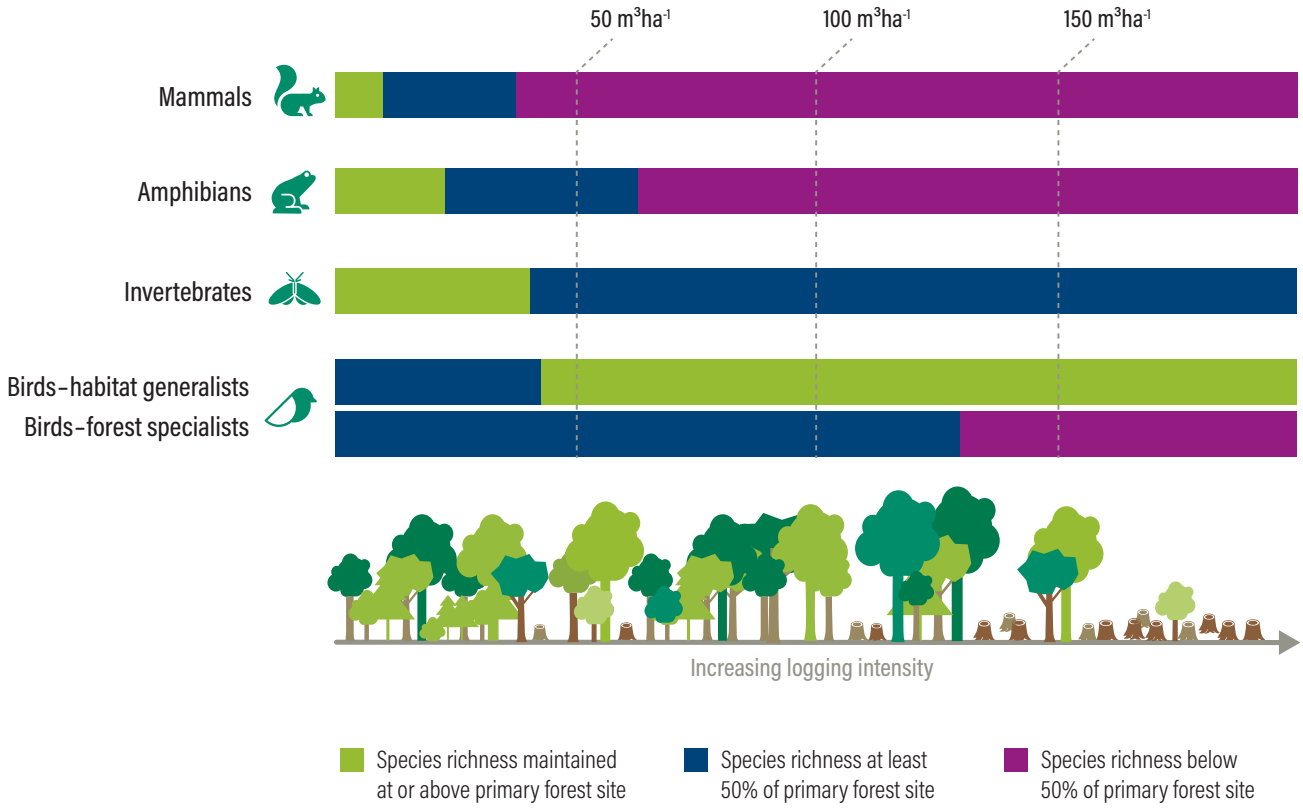
primary forests, either through agricultural clearing or forestry, typically has enormous consequences for biodiversity even if forests are eventually allowed to regrow naturally (Gibson et al. 2011), although the results in particular areas can depend on the taxa of species (Barlow et al. 2007).

Watson et al. (2018) provide a good summary of forestry effects on biodiversity:

> *Beyond outright forest clearance (which is the greatest threat facing biodiversity), forest degradation from logging is the most pervasive threat facing species inhabiting intact forests. Many species are sensitive to logging, and studies across many taxonomic groups have shown impacts increasing with the intensity of logging and with the number of times a forest has been logged. Fragmentation of intact forest blocks (and associated edge effects) is also a severe threat to forest-dependent species, especially those requiring large areas to maintain viable populations (for example, wide-ranging predators and tree species that occur naturally at very low densities). In temperate, boreal, and tropical forest regions, the loss of large contiguous tracts of forest has meant wide-ranging forest-dependent species have either retreated to the last remaining intact forest systems or are extinct. Furthermore, there is evidence that—even for some forest species that may persist for a time in degraded fragments—intact forests are necessary to ensure their persistence over the long term.*

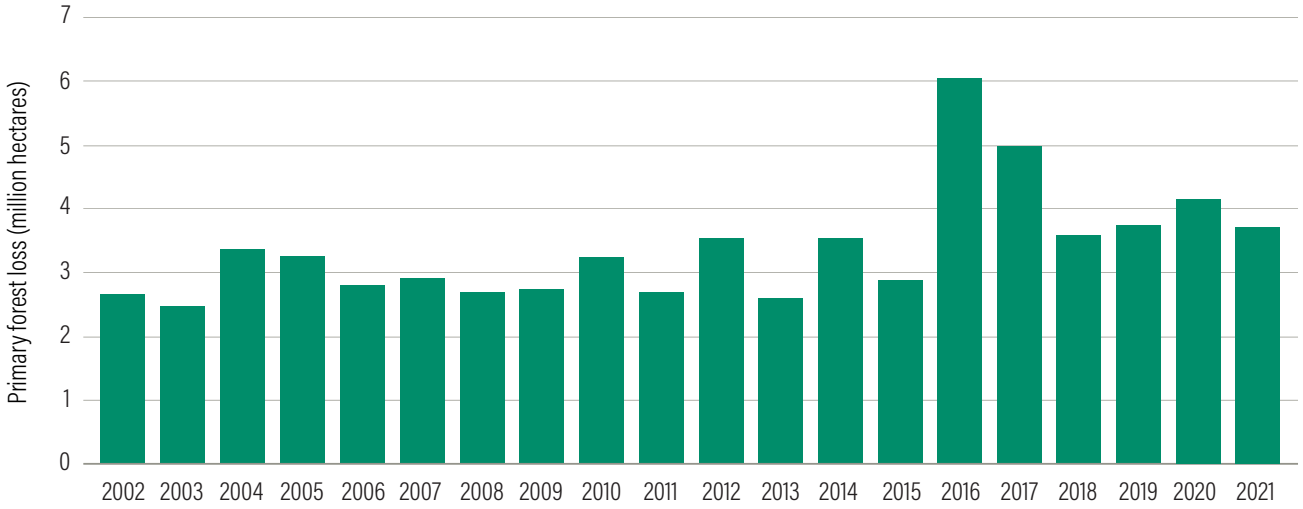
In general, more intensive logging means larger effects on biodiversity, as illustrated by Figure 4. The "generalist" bird species—birds that are relatively common anyway because of their ability to use a variety of habitats—may make greater use of heavily logged forests, but there are

Figure 4 | More intensively logged forest areas have larger effects on biodiversity



Source: Burivalova et al. 2014.

Figure 5 | Between 2002 and 2021, the world lost more than 60 Mha of humid primary forest



Source: Global Forest Watch 2022.

typically declines in the bird species that are of greater conservation concern because they rely on intact forests.

These differences in the biodiversity composition of forests due to forestry activities make the loss of intact forests a particular concern. Satellite data indicate a steady loss of roughly 3 Mha of intact tropical forests per year from 2002 to 2015 and an increase in loss of 4–5 Mha per year from 2016 to 2021 (Global Forest Watch 2022; Figure 5).

Even as they hold less biodiversity than primary forests, secondary forests can still harbor substantial biodiversity if allowed to recover naturally (Barlow et al. 2007; Chazdon et al. 2009; Koh and Wilcove 2008; Watson et al. 2018). Converting forests to forest plantations, however, nearly always causes large biodiversity habitat losses, with greater loss typically increasing with more intensive management (Brockerhoff et al. 2008; Paquette and Messier 2010; Pawson et al. 2013). One study in China's Shanghai Province found that plantations supported even less biodiversity (as measured by birds and bees) than agricultural lands (Hua et al. 2016). Specifically in the southeastern United States, one study found that loblolly pine plantations of any age had significantly less diversity amongst bird species relative to the native tree species (Haskell et al. 2006). Even in agricultural landscapes, natural forest patches may increase local biodiversity—for example, of pollinators—while plantation forests may not (Taki et al. 2011).

The conversion of native grasslands and savannas, many of which can support high plant diversity, also has large biodiversity consequences. The tallgrass prairies of the United States, which once typically harbored 300 more grass and herbaceous species per hectare, have been almost completely eliminated (Wilcove 2000). When replaced with pasture, typically only 1 or 2 grass species are present. The result has been large declines in grassland bird species and vast numbers of insect species, many of which we will never know about. The Brazilian Cerrado is one of the world's most biologically diverse ecosystems with more than 12,000 species of plants, of which 4,400 are found nowhere else (Silva et al. 2006). Most of the native Cerrado has been converted to agricultural use (Beuchle et al. 2015), including pasture that uses a single African grass species. Bengtsson et al. (2019) summarize:

In southern Africa, more than 20% of the grassland biome has been cultivated, 60% is irreversibly transformed to other land uses, and most of the remainder is used as rangeland for livestock. Over 90% of the semi-natural grasslands in northern Europe have been lost since the 1930s. In North America, 80% of the central grasslands has been converted to cropland. Similarly, more than 43 Mha of the Eurasian steppe have been converted into cropland, and 60–80% of the grassland area in South America is degraded.

2.5 The Importance of Reversing Habitat Loss Going Forward

Even as land-use change is ongoing, most strategies to solve climate change and to preserve biodiversity require that net land-use change stop and that some quantity of forests and other habitats be restored. For climate purposes, virtually all strategies that map out solutions to climate change require an almost immediate elimination of emissions from deforestation and other land-use change. Climate mitigation strategies generally focus on two alternative targets: a global average warming of 2°C or 1.5°C. Scientists have estimated a total, cumulative quantity of CO_2 emissions that can occur before exceeding these goals. By 2020, the remaining cumulative emissions allowable would have been around 400 $GtCO_2$ from all sources.[5] At ongoing rates of annual emissions, the emissions from land-use change alone would constitute more than a third of this cumulative emissions budget, leaving too little room for emissions from other sectors (energy, concrete, and waste). To hold warming to 1.5°C, most strategies rely on decreasing agricultural area to allow for reforestation or other land uses to take carbon out of the air (Rogelj et al. 2018; Sanderson et al. 2016).

Although much focus has been on protecting forests, climate and biodiversity are also greatly threatened by the ongoing conversion of the world's tropical woody savannas. These areas of scattered trees and grasses are roughly as extensive as the world's tropical forests (Popp et al. 2014). Although they hold less carbon than tropical forests, their conversion would still cause large releases of carbon, particularly relative to their potential agricultural yields, as well as high effects on biodiversity (Searchinger, Estes, et al. 2015).

Biodiversity protection requires the same goals. The United Nations found that not only does habitat loss threaten extinctions, but without habitat restoration, 500,000 species are likely to go extinct (IPBES 2019).

Among the reasons for immediate action, scientists believe that the Amazon rain forest is at a tipping point. Additional clearing of forest is likely to reduce the Amazon's internal generation of clouds and rainwater necessary for it to remain a rain forest (Barkhordarian et al. 2019; Lovejoy and Nobre 2019). If deforestation continues at present rates for even 10 more years, the Amazon could inexorably transform into a savanna, losing much of its present carbon.

Even as land-use change is ongoing, most strategies to solve climate change and to preserve biodiversity require that net land-use change stop and that some quantity of forests and other habitats be restored.

3. Projected Future Demands for Land and Carbon Implications

Increasing human demands for land are driven by rising populations and rising incomes. As of 2020, the global population was 7.8 billion. By 2050, according to the midrange UN projection, the population will likely rise to 9.7 billion (UNDESA 2019a).

Although global incomes remain highly unequal, there is likely to be a large increase in the number of people entering the "global middle class." For example, by defining *middle class* as the capacity to spend US$11 per person per day, the global middle class reached 3.8 billion in 2018 and is likely to reach 5.3 billion by 2030 (Kharas and Hamel 2018). Although vast numbers of people are living in poverty, the percentage of the population living in poverty is also generally declining (although it has increased during the COVID-19 pandemic).[6] People with higher incomes demand more food (and more land-intensive foods), more wood products, and more urban areas. In this section, we focus on projected increases in land use for these three purposes.

We examine scenarios with different levels of demand (e.g., BAU, high-demand, low-demand), and with different sources of supply. All future projections have uncertainties and all data about global land use and demands for food, wood, and other land-based products have serious limitations, so any projections of this type are rough. The purpose is to provide a "first order" sense of the challenges and to examine the relative significance of possible changes in demand and supply.

For this type of analysis, we use biophysical accounting models. Such models can estimate what the land use and carbon implications will be if a given number of people eat a given diet and consume a certain amount of wood. These kinds of models also make it possible to determine the necessary mixtures of demand and production systems, such as levels of diets and crop yields, to achieve any land-use and climate goal while meeting projected future human needs. Biophysical models do not tell policymakers how to achieve these levels of demand and production systems, but they take the first step towards determining what those levels ought to be to meet an environmental goal.

In biophysical models, including those used in this report, economics can still play a role in the background for estimating future baselines, such as future food and wood demands under BAU. For example, estimated relationships between levels and types of consumption and both incomes and population play a role in the estimates incorporated into our modeling of future demands. The use of trend-line relationships also implicitly incorporates economic factors in a crude way: to the extent that past changes in prices have played a role influencing demand and supply, a trend-line analysis implicitly assumes that these price effects will, in aggregate, have the same continuing effect. These estimates, however, become inputs to the biophysical models to estimate land-use and GHG implications.

For our purposes, biophysical models have at least two advantages over economic models:

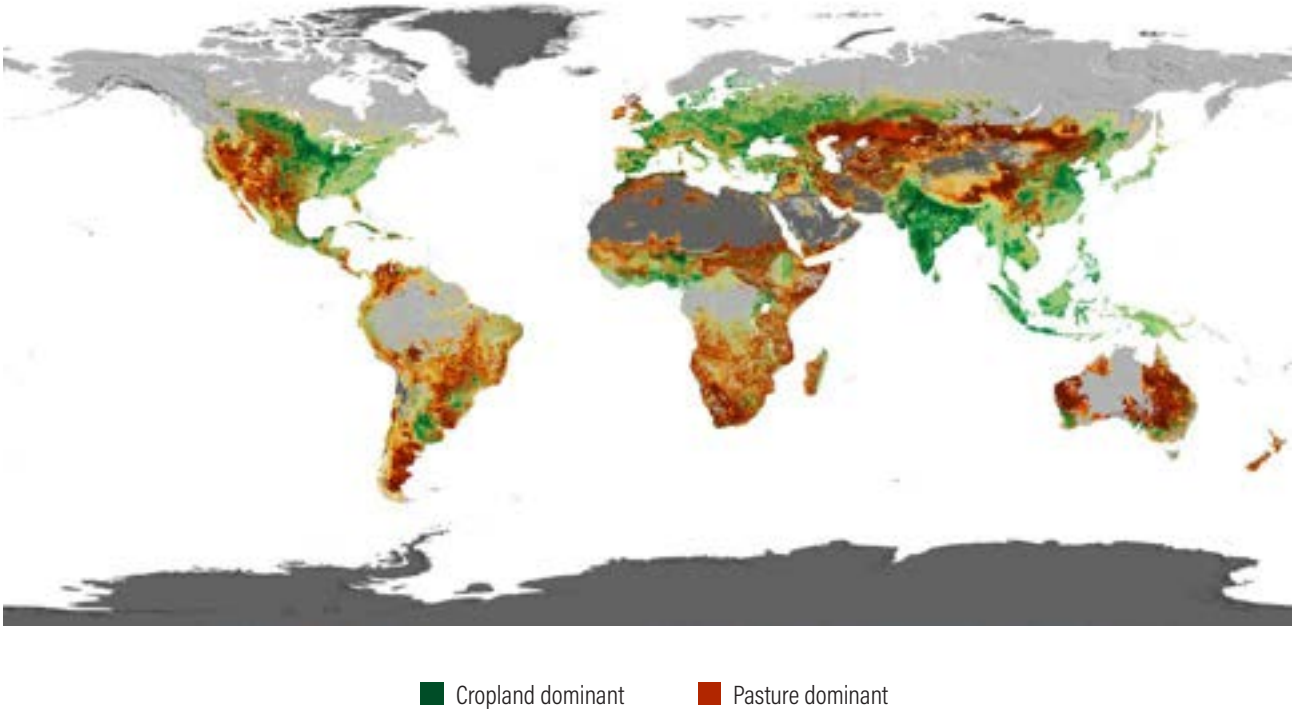
- Although they do not attempt to analyze economic feedbacks, biophysical models can provide answers with greater certainty. Economic models have to start with the same biophysical relationships, but they then add economic relationships (such as demand and supply elasticities) that are extremely hard to estimate at global scales. Long-run elasticities are particularly hard to estimate, as are future elasticities, which will change with unknown technological and social developments. Leaving out economic impacts does not mean they cannot be important for policy. But it at least allows for a more straightforward analysis of certain questions, like how much land would be converted to uses for food production if demand and yields grow by certain percentages. Economic responses might influence how much demand and yields change, but they are not necessary to determine what the land-use consequences are of those changes.
- Using economic models to determine goals can cause confusion. For example, an economic model might project that if policymakers increase demand for wood or crops (e.g., for bioenergy), land use might not expand fully to meet the new demand because higher prices would cause other people to eat less or governments to adopt policies that would lead to farmer increases in yields (Searchinger,

Edwards, et al. 2015). If reliable, such information can be informative for some purposes, but it could also misinform. By assuming changes in government policy, such a model result could also fail to communicate the need for governments to actually change policies. Biophysical accounting models communicate what combinations of changes in production and consumption are necessary, which then can inform policymaking.

3.1 Projected Agricultural Expansion and Carbon Implications

At around 5 Bha, agriculture—including both cropland and pastureland—is the dominant human use of land, occupying nearly half of the world's vegetated land (Figure 6). Agriculture is also the primary historical and ongoing driver of deforestation (Curtis et al. 2018; Millennium Ecosystem Assessment 2005). In addition to rising population, as poverty rates decline and the global middle class increases, people are likely to shift from eating mostly staple crops to diets with greater shares of vegetable oils, fruits and vegetables, and more animal-based foods (meat, fish, eggs, and dairy; Tilman and Clark 2014; Valin et al. 2014). All of these foods require more land per calorie (and/or per gram of protein) relative to staple crops (Ranganathan et al. 2016; Searchinger, Wirsenius, et al. 2018; Tilman and Clark 2014; Willett et al. 2019). Meat and milk are particularly land intensive. Per gram of edible protein, typical estimates are that pulses require around 3 times less land than chicken and pork (as a global average), 5 times less than dairy, and around 20 times less than beef (Ranganathan et al. 2016; Searchinger, Wirsenius, et al. 2018).

Figure 6 | Cropland and pastureland occupy nearly half of the world's vegetated land



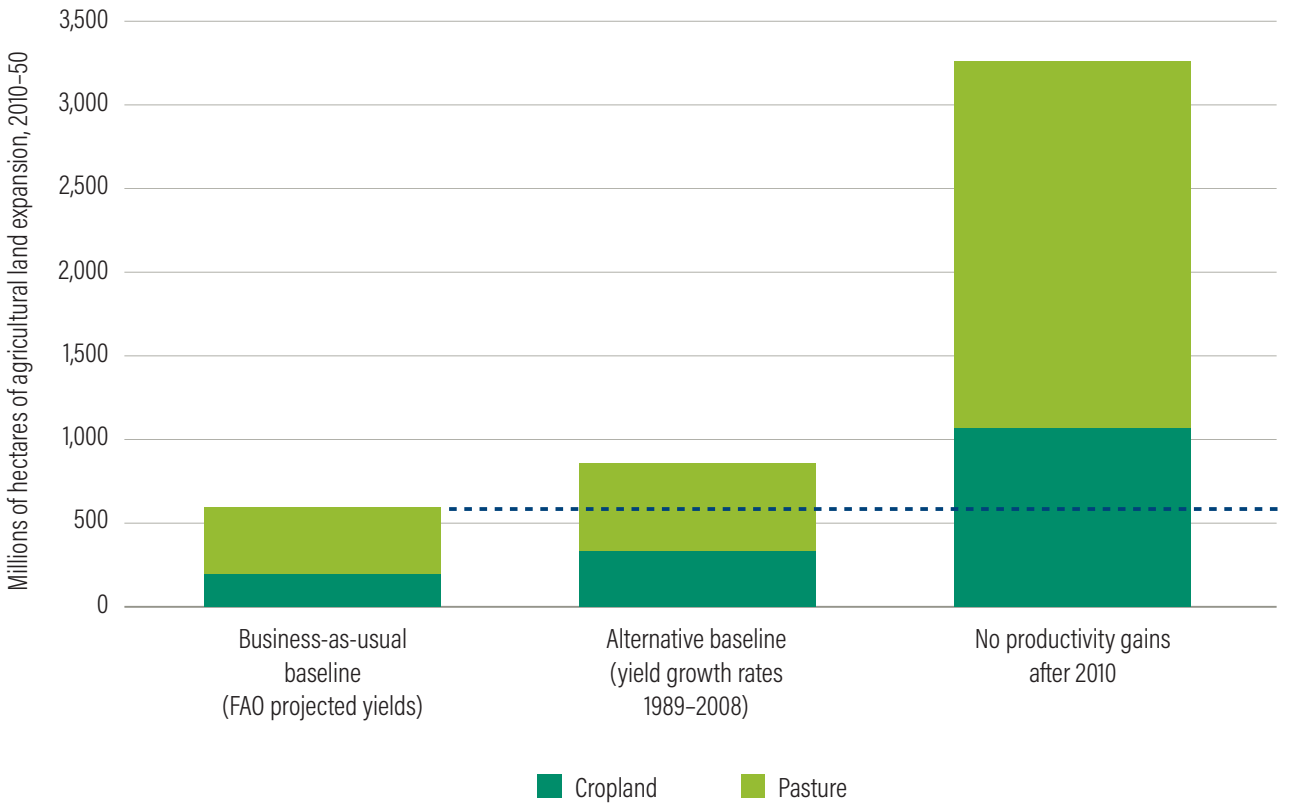
Note: Areas in gray contain neither cropland nor pastureland.

Sources: Ramankutty et al. 2008; map from Navin Ramankutty, University of British Columbia.

One way of viewing the land-use challenge is to estimate agricultural land-use requirements to meet projected future food demands with today's crop yields and livestock feeding efficiencies. WRI used a biophysical model called GlobAgri-WRR (Box 3) to do so in the *Creating a Sustainable Food Future* report. The report estimated that BAU food demand (as measured in crop calories) would rise by 56 percent between 2010 and 2050, with meat and dairy demand rising by 68 percent. Keeping 2010 food production systems constant, we found that global agricultural land use would have to increase by 3.3 Bha between 2010 and 2050 to meet that level of food demand (Searchinger et al. 2019). Bringing 3.3 Bha of additional lands into food production would require the conversion of most of the world's remaining tropical and temperate forests and woody savannas, and it would release an amount of carbon from land-use change that, by itself, would make it impossible to reach climate targets. This number means that a combination of yield gains, livestock efficiency improvements, and reductions in demand growth are needed to avoid this massive land clearing (Figure 7).

Another way to estimate the agricultural land-use challenge is to assume that crop yields will continue to grow into the future as they have in the recent past and to project reasonable improvement in livestock efficiencies as well. Figure 7 shows WRI's estimates. The BAU baseline scenario assumes that yields grow at their average rates from 1961 to 2008, and the alternative baseline scenario assumes that yield growth rates from 1989 to 2008

Figure 7 | Depending on assumptions, agricultural land in the 2050 baseline could grow by hundreds of millions or even billions of hectares compared to 2010



Notes: FAO = Food and Agriculture Organization of the United Nations. The cropland increase includes a 20 million hectare (Mha) increase in aquaculture ponds under the two projected baselines and a 24 Mha increase in the projection with no productivity gains after 2010.

Source: GlobAgri-WRR model in Searchinger et al. 2019.

will prevail into the future. The BAU baseline scenario estimates the need to expand cropland by roughly 200 Mha and pastureland by 400 Mha, for a total of nearly 600 Mha between 2010 and 2050—an area nearly twice the size of India. The alternative baseline scenario, which uses more recent yield growth rates, estimates a need to clear more than 850 Mha (Searchinger et al. 2019).

Even our main BAU baseline scenario in Figure 7, with nearly 600 Mha of agricultural expansion at the expense of forests and woody savannas, along with ongoing degradation of peatlands, would release roughly 240 $GtCO_2e$ into the atmosphere over the 40-year period, or 6 $GtCO_2e$ per year (Searchinger et al. 2019). To put that level of emissions in perspective, it is equal to 25–40 percent of the estimated maximum cumulative carbon dioxide emissions "budget" from all human sources between 2010 and 2050 to limit warming to 1.5°C–2°C; such a result would make it very difficult, if not impossible, to hit these climate targets given the large emissions cuts also needed in the energy sector. More recent papers have concurred that ongoing emissions from land-use change threaten the world's ability to meet Paris Agreement climate goals, especially given projected future food demand growth (Clark et al. 2020; Hong et al. 2021).

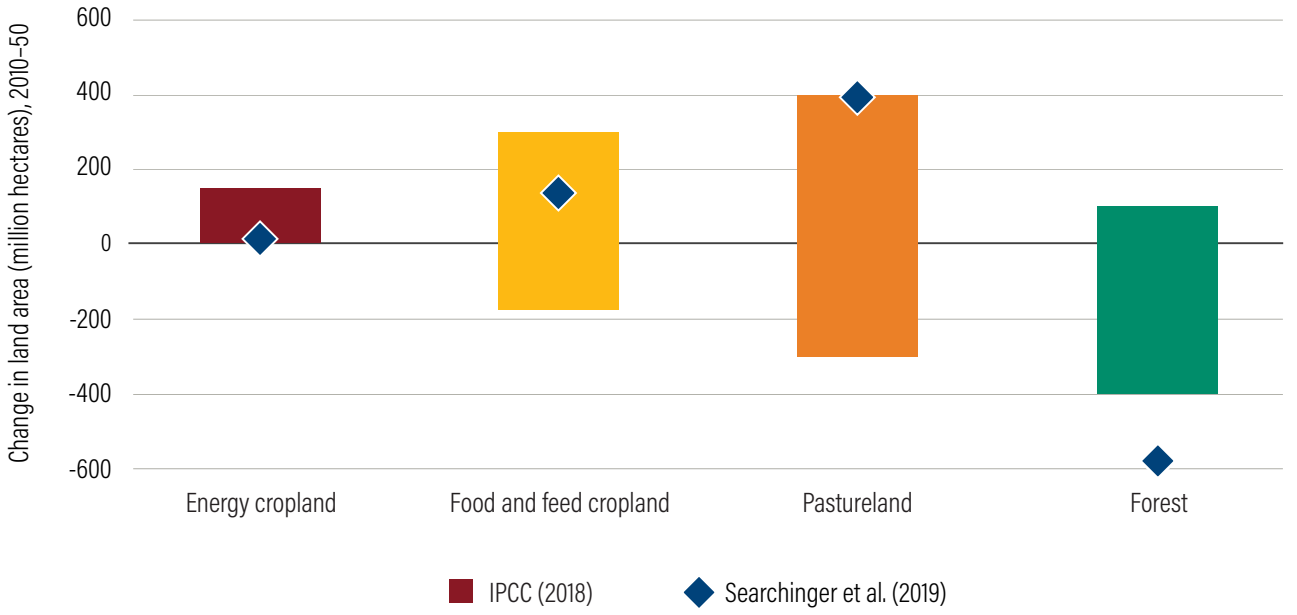
Other researchers have also projected a large growth in agricultural land demand by 2050 to feed a growing population, using both biophysical and economic models. For example, a majority of the agro-economic models reviewed in Schmitz et al. (2014) project increases in cropland and pasture area, with 6 of the 10 models reviewed projecting a cropland increase at least as large as that in *Creating a Sustainable Food Future*. The IPCC (Rogelj et al. 2018) recently summarized a wider range of models (Figure 8), and the *Creating a Sustainable Food Future* report's BAU baseline agricultural land demand projections mostly fall within these ranges. Biophysical-only models tend to project even larger growth in agricultural land demand. Bajželj et al. (2014) projected an increase in cropland and pastureland of more than 1 Bha between 2009 and 2050, and Tilman and Clark (2014) projected an increase in cropland alone of 600 Mha. And although certain analyses are more optimistic and project smaller growth or even declines in agricultural area out to 2050 (e.g., the lower estimates in Figure 8), Searchinger et al. (2019) noted that such analyses tend to rely on overly optimistic estimates. For example, they tend to assume that yields grow in a compound rather than linear fashion, or they use lower, out-of-date 2050 population estimates. That said, the majority of the IPCC's point estimates project BAU forest loss in the hundreds of millions of hectares between 2010 and 2050 (Rogelj et al. 2018).

BOX 3 | Overview of the GlobAgri-WRR Model

GlobAgri-WRR is a global accounting and biophysical model developed by researchers with the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) and Institut national de la recherche agronomique (INRA), World Resources Institute, and Princeton University. The model estimates land-use demands and greenhouse gas emissions related to food production and consumption scenarios, including emissions from land-use change, as agricultural land demand grows or shrinks. It links two data sets from the Food and Agriculture Organization of the United Nations on agricultural production and food supply/consumption (Food Balance Sheets) and accounts for the multiple products (e.g., food, feed, energy) generated by the world's crops. Production-side parameters, such as yields and emissions intensity, can be altered, along with consumption-side parameters, such as human population, dietary patterns, trade patterns, and levels of waste.

Like the Carbon Harvest Model developed for this paper, GlobAgri-WRR does not try to estimate economic feedback effects (e.g., changes in demand for products as prices change). This focus on biophysical relationships helps make the model more transparent as it does not need to include the many econometric assumptions of such models, which would otherwise introduce a high quantity of complexity, especially when projecting three decades into the future. Economic relationships are not necessary to estimate the land-use and climate consequences of a set of production and consumption practices by themselves, which is the focus of this report.

Figure 8 | BAU projections of land-use change between 2010 and 2050 suggest additional large-scale conversion of forest to cropland and pastureland



Note: The forest loss estimate in Searchinger et al. (2019) is not necessarily comparable because it includes the loss of woody savannas. These estimates also do not consider changes in land extent of forestry activities.

Sources: Rogelj et al. 2018, Figure 2.24; Searchinger et al. 2019.

Although future projections are inherently uncertain, these differences in projections do not alter the scope of the land-use challenge; they just reflect different judgments about the likelihood of meeting these challenges under some concept of BAU. Differences in future projections depend mainly on differences in projected future diets or different projected increases in crop yields, pasture output, or livestock efficiencies.[7] Even if a model projects less land-use change, that result still depends on such factors as moderating growth in demand for meat and milk and achieving high increases in output of food per hectare.

The biggest differences in model results are in projected pasture areas. These differences are important because pastures are commonly identified as an available source of land for a wide range of other uses, from cropland to wood plantations to bioenergy plantations. Pasture area projections face a variety of data uncertainties; even estimates of present pasture area are highly variable, as are the quantities and the quality of the forages they provide and the feed uses of most of the world's cattle.[8]

These uncertainties, however, do not dramatically alter our understanding of the challenge. Forages of some kind, whether from pasture or cut-and-carry grasses, are the largest source of feed for cattle (Herrero et al. 2013). There is broad agreement of the technical potential to increase efficiency of production based on wide disparities in production efficiencies (Cardoso et al. 2016; Herrero et al. 2013; Strassburg et al. 2014). However, absent government protection, it is also cheap to convert forests to pasture (Searchinger et al. 2019), which helps explain why it is occurring extensively in

Brazil, Bolivia, Colombia, and Paraguay, among other countries (Aide et al. 2013; Rausch et al. 2019). Major institutional barriers also prevent many farmers from investing in improved technologies, such as the lack of a clear title, which is pervasive in Colombia. These obstacles must be overcome at a vast scale to meet rising demand without clearing more land. *Creating a Sustainable Food Future* estimated that every improvable hectare of pasture in Latin America would likely need to triple its yield to meet FAO projections for global beef and dairy consumption in 2050 without further pasture expansion.

The land demand projections in *Creating a Sustainable Food Future* were based on FAO diet and yield projections from 2012 and applied from 2010 to 2050, so it is possible now to compare those projections with more recent trends (Lebling et al. 2020). Those recent trends have both bad news and good news. In general, demand for overall meat and dairy has been growing closely in line with our projections. There is no global sign of moderation in the growth of these key food items, which play a disproportionate role in driving agricultural demand for land. The main source of good news is that our projected 88 percent increase in total global ruminant meat consumption—the most land-intensive type of food—so far appears high. Between 2012 and 2017, per capita ruminant meat consumption actually slightly declined (FAO 2020a), setting a global pace closer to 35 percent total global consumption growth between 2010 and 2050. Unfortunately, this change did not occur because of major declines in high-consuming developed countries. Instead, it resulted from small declines in high-consuming countries and a stagnation in per capita consumption at very low levels in low-income countries. In fact, per capita consumption decreased from already low baselines in sub-Saharan Africa.

As we discuss above, the overall result of demand and yield changes has been an accelerating expansion of cropland in ways that are consistent with our prior projections.

3.2 Projected Urban Expansion and Carbon Implications

Growth in areas of human settlement presents another large source of increased future demand for land. The estimates of current global urban area range from less than 1 percent to almost 3 percent of global land area, excluding Antarctica and Greenland because of different definitions, classification methods, and spatial resolutions (Liu et al. 2014).[9] Estimates of actual artificial surfaces are on the order of 30–60 Mha, or 0.23–0.50 percent of global land area. Most global-scale urban area expansion projections preferred to use "built-up area" data sets as their base map (Seto et al. 2012), such as MODIS v5, due to their higher levels of accuracy (Potere et al. 2009; Schneider et al. 2009). As indicated in these references, estimates of city or urban administrative areas that incorporate other vegetated and barren land around the built-up areas can reach 2.64 percent of global land area.

The urban percentage of the world's population is projected to increase from 55 percent in 2018 to 68 percent in 2050 (UNDESA 2019b), suggesting that around 2.5 billion more people will be living in urban areas by 2050 compared to 2018. This large population increase implies a large expansion in urban land area and infrastructure in the next three decades.

A number of studies use different statistical tools to project urban area growth in the coming decades. At the low end, Angel et al. (2005) estimated 100 Mha of total urban area in 2030, but that still represented a more than doubling in area from their estimate of urban area in 2000, which focused mainly on artificial surfaces. Later, Angel et al. (2011) estimated an urban area of 216 Mha in 2040 under an assumption, based on observed trends, that the average density of the urban population is decreasing 1 percent per year because of sprawling development. Table 1 lists the projections, methods, and inputs for different urban area projections, and Figure 9 shows the current and future urban area estimates from these studies. Overall, the mean estimates are for a roughly 100 Mha increase in urban area between 2000 and 2050. When scaled to our 2010–50 study period, the increase would be 80 Mha.

Table 1 | Projections of Global Urban Area in 2030, 2040, and 2050

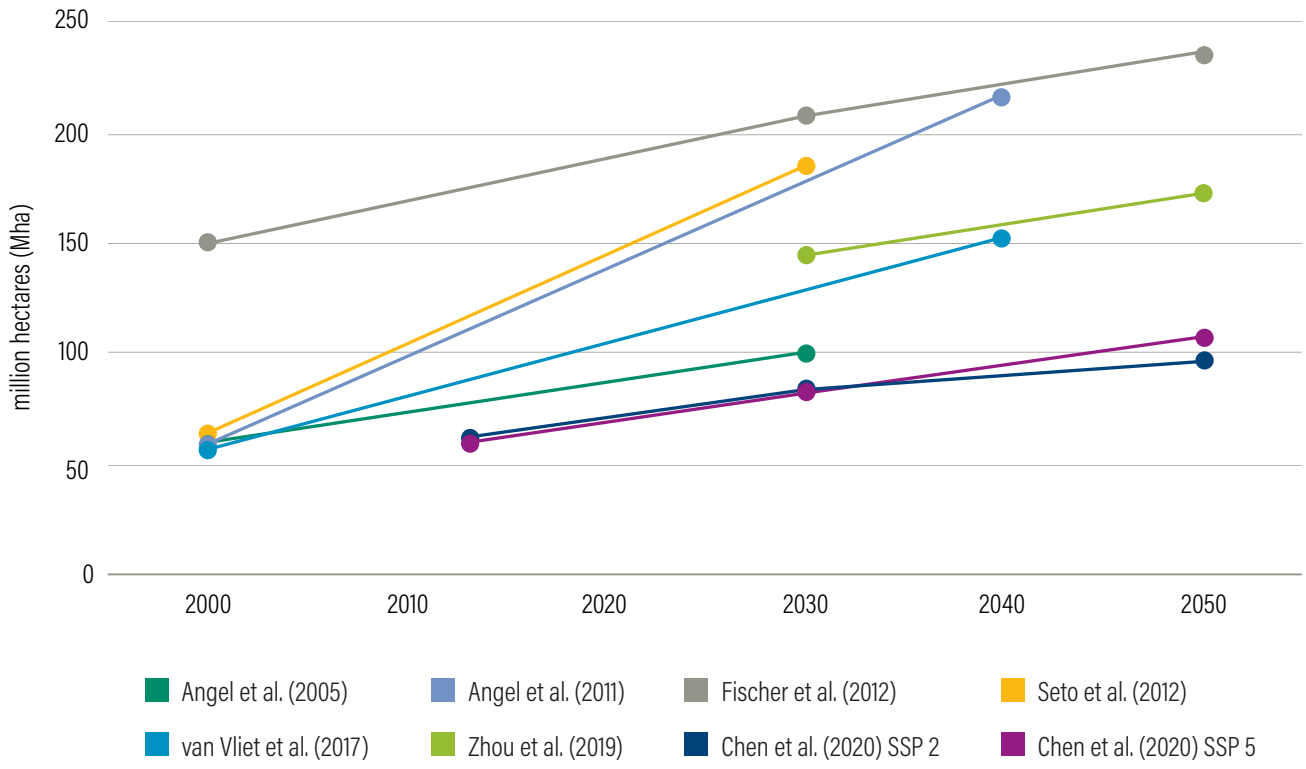
	PRESENT URBAN AREA (MHA)	PROJECTED FUTURE URBAN AREA (MHA)	METHODS	INPUTS
Angel et al. 2005	**2000** 41	**2030** 100	Logarithmic regression model	UN urban population, income, agricultural rent, climate, exclusion area
Angel et al. 2011	**2000** 60	**2040** 216	Logarithmic regression model	UN urban population, 3 realistic density change scenarios
Fischer et al. 2012	**2000** 152	**2030** 206 **2050** 233	IIASA world food system model (general equilibrium)	Climate model, production, demand, trade parameters[a]
Seto et al. 2012	**2000** 65	**2030** 186	Probabilistic forecasts with GDP and urban population, land-change model GEOMOD	UN GDP and population projection, GRUMP population density, slope, distance to roads, population density land cover
van Vliet et al. 2017	**2000** 58	**2040** 154	Urban demand model IMAGE, land-change model CLUMondo	UN population medium scenario, land system maps
Zhou et al. 2019		**2030** 147 **2050** 173	Urban growth model SLEUTH (cellular automata)	LandScan population, slope, exclusion area, hill shade, transportation, historical urban distribution
Chen et al. 2020, SSP2	**2010** 60	**2030** 80 **2050** 97	Panel data regression for land demand with GDP per capita and urbanization, land-use model FLUS (artificial neural networks)	SSP GDP and population projection, distance to city center, distance to road network, distance to airport, elevation, slope, eco-region, and water resource condition
Chen et al. 2020, SSP5	**2010** 60	**2030** 85 **2050** 108		

Notes: FLUS = Future Land Use Simulation; GDP = gross domestic product; GRUMP = Global Rural-Urban Mapping Project; IIASA = International Institute for Applied Systems Analysis; SSP = Shared Socioeconomic Pathway.

a. Fischer 2009.

In assessing global land-use competition, one study found that 64 percent of urban expansion between 1992 and 2015 displaced croplands; 9 percent, forests; 13 percent, shrublands; and 10 percent, grasslands (van Vliet 2019). Since urban land is often located in areas suitable for crop production, and food demand is still growing, a shift from croplands to urban areas means that crops will need to be produced in other areas, potentially with higher elevations and steeper slopes, which can reduce crop yields. Van Vliet et al. (2017) estimated a potential displacement of crop production at 65 million tons between 2000 and 2040 due to urban expansion.

Figure 9 | Studies have different estimates and projections for urban areas



Note: SSP = Shared Socioeconomic Pathway.

Because urban expansion affects native habitats and their carbon not only directly but also by displacing and pushing croplands into those habitats, an average carbon cost per hectare of new cropland can provide a reasonable basis for estimating the global carbon costs of this urban expansion, holding agricultural land uses constant. (For urban area expansion to result in less loss of native habitats, it would have to cause some combination of reduced food consumption and higher land-use efficiency gains in agriculture than those incorporated into our baselines. Any effect of urban expansion on agricultural land area is implicitly incorporated into our independent agricultural projections because they are based on trend lines.) Urban areas can continue to hold some carbon stocks, such as in parks and people's yards. That amount obviously depends on the precise definition of urban areas used by each projection. For example, in the United States, one study found average vegetative carbon stocks of 0.4–0.5 tons of carbon (tC) per hectare in heavily urban areas of Seattle and 12–18 tons per hectare in medium urban areas (Hutyra et al. 2011). Overall, we estimate that additional urban expansion of 80 Mha between 2010 and 2050 is likely to directly cause carbon losses of 27.0 $GtCO_2e$, or 0.7 $GtCO_2e$/year.[10]

3.3 Projected Expansion of Forestry and Carbon Implications

Analyses of the land-use and carbon implications of wood harvests inherently differ from those of agriculture and urban land expansion. The conversion to agriculture and urban use, as we and others analyze it, involves a one-time change in carbon stored on each hectare. The assumption behind forestry activity is that some kinds of trees will regrow on harvested lands. All land uses tend to have indirect effects on adjacent lands, but the direct effects differ in this fundamental way.

Even though some kind of forest will typically regrow, forest harvests cause immediate losses of both carbon and biodiversity. Over time, both can significantly recover, but that recovery typically takes decades at least (and cutting old-growth forests can have permanent effects on biodiversity). Some tropical savannas may recover relatively quickly while harvesting temperate, old-growth rain forests (of which only remnants now remain) would take many hundreds of years to fully recover (Rozendaal et al. 2019).

One common way to evaluate the effects of forestry is to compare the average carbon stock and biodiversity of regularly harvested forests with that of an unharvested forest. In other words, if forests are harvested every 50 years, a carbon or biodiversity analysis would compare the average carbon stock and biodiversity of the forest over the entire rotation with that of an unharvested forest. We do not follow this approach for carbon because it understates the significance of time. GHG emissions need to be constrained heavily in the coming decades to avoid crossing critical climate thresholds. Ambitious climate targets for 2050 adopted by the Paris Agreement largely reflect that idea. A judgment of climate effects should reflect the need for short-term GHG reductions, which also imply costs for short-term GHG increases.

We address the effects of future forestry in two ways:

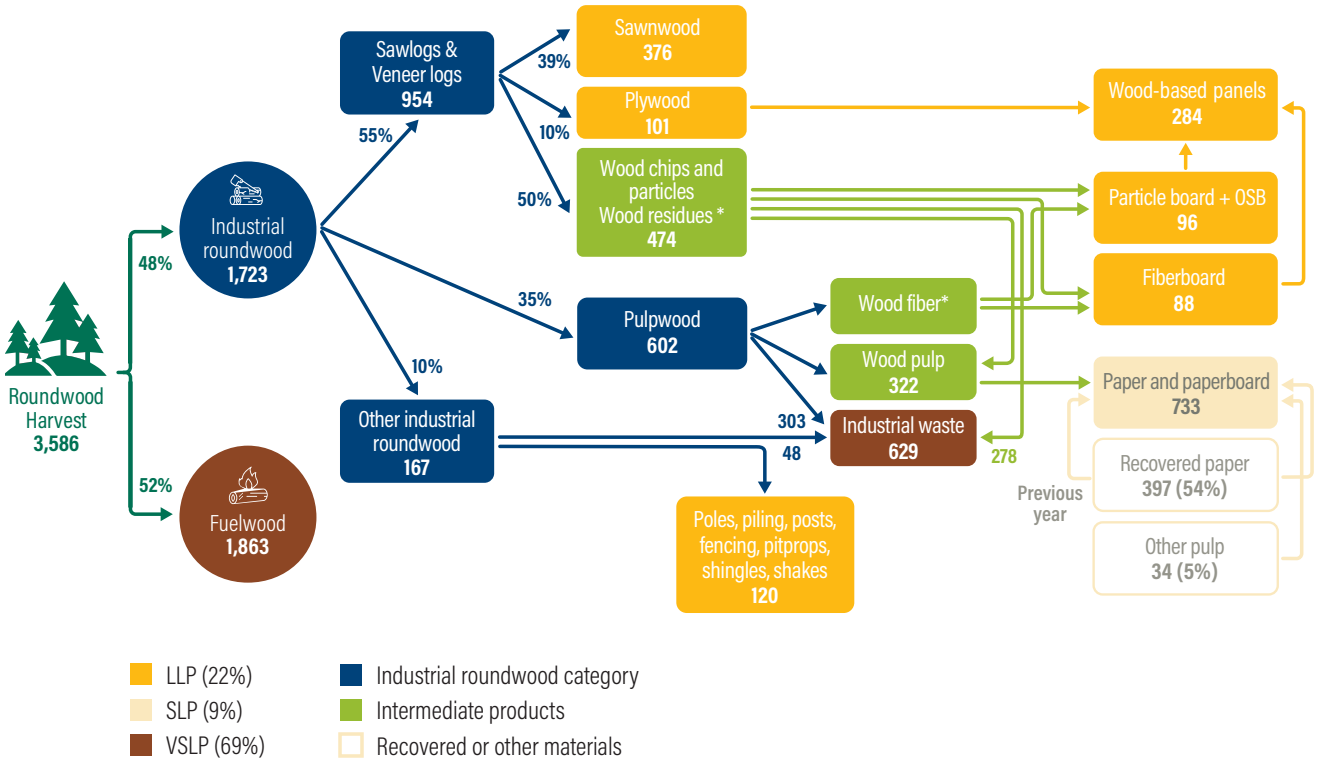
- First, we estimate the area likely to be directly affected by forest harvests. Most of these forest areas are likely to have been harvested in the past, but the ongoing harvesting continues to cause carbon losses and biodiversity effects, as discussed above. We analyze these forest areas using different scenarios of potential future harvests.
- Second, we estimate the carbon consequences of these future harvest scenarios. In doing so, we use a time-discounting value (described below) to value the carbon losses between 2010 and 2050. Unlike agricultural expansion, there are far fewer efforts to estimate the future scope and consequences of forestry on land use and the climate; to our knowledge, none of these efforts uses our time-discounting approach. We therefore start by analyzing future demand for wood products.

3.4 Projected Future Demand for Wood Products

Using FAO's widely adopted approach, global wood harvests are divided into two categories: industrial roundwood and fuelwood. Industrial roundwood is essentially any wood harvested for commercial purposes, and fuelwood is generally wood harvested by individuals or small groups for their own fuel uses. Fuelwood is primarily harvested in developing countries and includes wood used for charcoal (Houghton and Nassikas 2017). Some fuelwood has also been harvested in more developed countries, primarily for heating, and in recent years, government policies have caused an expansion of industrial wood harvests of logs for electricity and other energy uses. Industrial roundwood itself falls into three categories: generally larger logs that are sawn into timber or peeled to provide veneer, typically called sawlogs and veneer logs; generally smaller logs harvested for paper, particleboard, and paperboard (e.g., cardboard), called pulpwood; and other industrial roundwood. Figure 10 shows the initial breakdown of roundwood production in 2010 (FAO 2020a): fuelwood (1.9 billion cubic meters [m^3], or 52 percent), sawlogs and veneer logs (954 million m^3, or 26 percent), and pulpwood (602 million m^3, or 17 percent).

Although harvested wood initially falls into these three major categories, the production of wood products generates wastes along the way, and those wastes in turn contribute to other products. For example, the production of sawn wood, such as wood boards, and plywood generates smaller wood chips and particles, which in turn are mostly used for making some wood-based panels or paper products or are burned for energy. (Overall, wood-based panels include plywood and oriented strand board [OSB] often used in construction and particleboards used for furniture.) Much of the wood used to make paper products is also burned for energy in the production process. Tracking these different wastes and flows is necessary to estimate future quantities of wood harvests to meet rising demand for final products and to estimate how long the carbon in this wood remains stored in some use or is emitted to the atmosphere.

Figure 10 | Harvested wood flows into different products (production by volume, million cubic meters, 2010)



Notes: LLP = long-lived product; OSB = oriented strand board, SLP = short-lived product; VSLP = very-short-lived product. Wood chips and particles and wood residues exclude the chips in production of pulp, particleboard, fiberboard, and chips counted as pulpwood, fuelwood, and other industrial roundwood. The quantity of wood fiber (source materials for fiberboard, particle board, OSB) is not reported by FAO. The unit of wood pulp is converted from tons (10 percent moisture content) to cubic meters (m^3) by multiplying 1.87 m^3/ton. This conversion factor is determined as (1–10 percent moisture)/wood basic density, where we used a global average density 0.48 tons/m^3 derived from the forestry products conversion guideline of the Food and Agriculture Organization of the United Nations. The shrinkage of total roundwood is neglected due to lack of information. Numbers may not add to 100% due to rounding.

Source: FAO 2020a.

Although FAO's data do not directly track this flow of wood, and its reporting includes many overlapping categories, we used a combination of FAO data and reported production parameters to construct the flow of wood harvests into different uses both globally and by country. We ultimately tracked this wood into four major categories based on the source and how long the product remains before being thrown out or burned (Table 2):

- Long-lived product (LLP) used for construction and furniture
- Short-lived product (SLP) used for paper and cardboard products
- Very-short-lived product used immediately for fuelwood (VSLP-WFL)
- Very-short-lived product burned for energy as a by-product of other wood production (VSLP-IND)

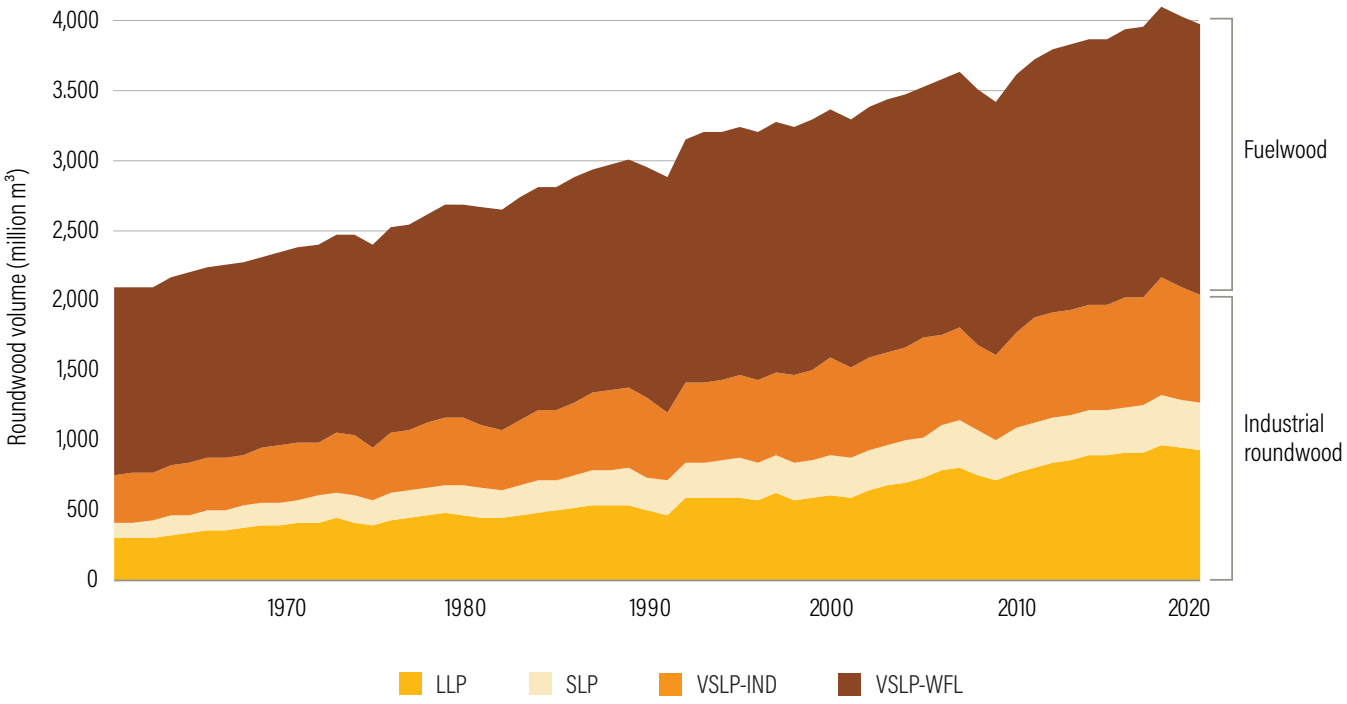
In 2010, LLPs constituted 22 percent of total roundwood, including sawn wood, wood-based panels, and other industrial roundwood. The production of paper and paperboard is supplied by wood pulp (43 percent of the paper products) and recycled paper and other pulp (57 percent). (We used the FAO category "wood pulp" instead of "paper and paperboard" to represent SLPs

because that way we can close the material balance of total roundwood harvested.) SLPs constituted about 9 percent of total roundwood. VSLPs-WFL constituted 52 percent of wood harvested, and VSLPs-IND constituted 18 percent. Overall, VSLPs constituted 69 percent of total roundwood, which means that a large majority of all wood harvested is quickly burned, releasing its carbon back into the air. (We discuss our estimates for how long these different products persist below.)

Note, however, that the FAO does not map production to uses comprehensively. For example, it does not report VSLP-IND, the waste from wood production that is burned. Due to FAO's great data challenges, we were not surprised to discover inconsistencies between the different categories of product consumption—particularly by country—which required judgments and adjustments to reconcile in a physically sensible way. As described in Appendix A, we reconstructed this flow by adding the VSLP-IND category and adjusted the raw total roundwood estimates for each country.

World wood harvests, production, and consumption have been rising for decades (Figure 11). Researchers examining wood demand, as with food demand, have previously found relationships between the level of demand, population, and gross domestic product (GDP). This relationship suggests that wood consumption will increase in light of projections by the United Nations that global population will increase 40 percent between 2010 and 2050 and that GDP per capita will grow between 60 percent (lower bound based on linear time trend) and 111 percent (upper bound based on the Shared Socioeconomic Pathway 2, or SSP2). We interpreted these as indicative relationships. In theory, the quantity of wood use could drive

Figure 11 | Global total roundwood production increased from 1961 to 2020



Notes: LLP = long-lived product; SLP = short-lived product; VSLP = very-short-lived product.

Source: Authors' estimates based on FAO 2020a.

Table 2 | Wood Demand Categories from FAOSTAT Wood Products

CATEGORY	FAOSTAT ITEM CODE	WOOD PRODUCT	SHORT NAME	UNIT	CONVERSION FACTORS
Long-lived product (LLP)	1872	Sawnwood	SNW	m^3	0.48 dry matter tons/m^3
	1873	Wood-based panels	WBP	m^3	
	1871	Other industrial roundwood	IND-0	m^3	
Short-lived product (SLP)	1875	Wood pulp	WPL	tons (10% moisture)	0.90 dry matter tons/ton
Very-short-lived product (VSLP)	1864	Wood fuel	VSLP-WFL	m^3	0.48 dry matter tons/m^3
		Industrial waste	VSLP-IND	m^3	
Other	1876	Paper and paperboard	PPB	tons (10% moisture)	0.90 dry matter tons/ton

Source: Conversion factors from FAO et al. 2020.

GDP growth rather than the other way around, but because wood consumption is a small part of overall GDP growth, that is unlikely. And even if both wood use and per capita income were driven by a third, unknown factor related to both, per capita income growth could still be a good predictor of future wood use.

However, examination of the different countries' wood use data—even with similar per capita incomes—indicates that wood consumption also varies significantly between countries, probably influenced by the availability of wood. For example, countries such as the United States and Sweden, with abundant forests, use far more wood than Spain, which has few forests. To project future wood demand, we therefore used a "fixed-effects" (FE) model (Wooldridge 2001) based on the relationship between per capita wood consumption and socioeconomic factors (e.g., demographics, income levels, technology). This type of model estimates a common relationship of wood consumption to each country's per capita income growth but applies that trend line to a different baseline level of wood consumption in each country.

We derived separate relationships (12 "models") based on three different types of wood products, two different trend lines in developed and developing countries, and two different regression formulas. We selected sawn wood, wood-based panels, paper and paperboard, and wood fuel for our projection of wood product consumption because their consumption is directly driven by socioeconomic factors and have statistics that can be tracked through trade. (Items such as wood pulp, other industrial roundwood, and industrial waste do not have trade statistics.) Wood consumption, in general, has a positive relationship with GDP per capita. However, some high-income countries, such as Australia, Canada, Japan, and the United States, saw decreases in their historical per capita consumption of sawn wood and wood-based panels and paper consumption as their GDP per capita grew beyond certain levels. We therefore separated the countries into developed and developing countries to avoid overestimating future wood consumption in high-income countries. We used a threshold of USD 40,000 for sawnwood and wood-based panels, and a threshold of USD 12,000 for paper, paperboard, and fuelwood. We

applied two types of formulas, one including the effect of development and policy change after 2000, and the other one excluding the effect.

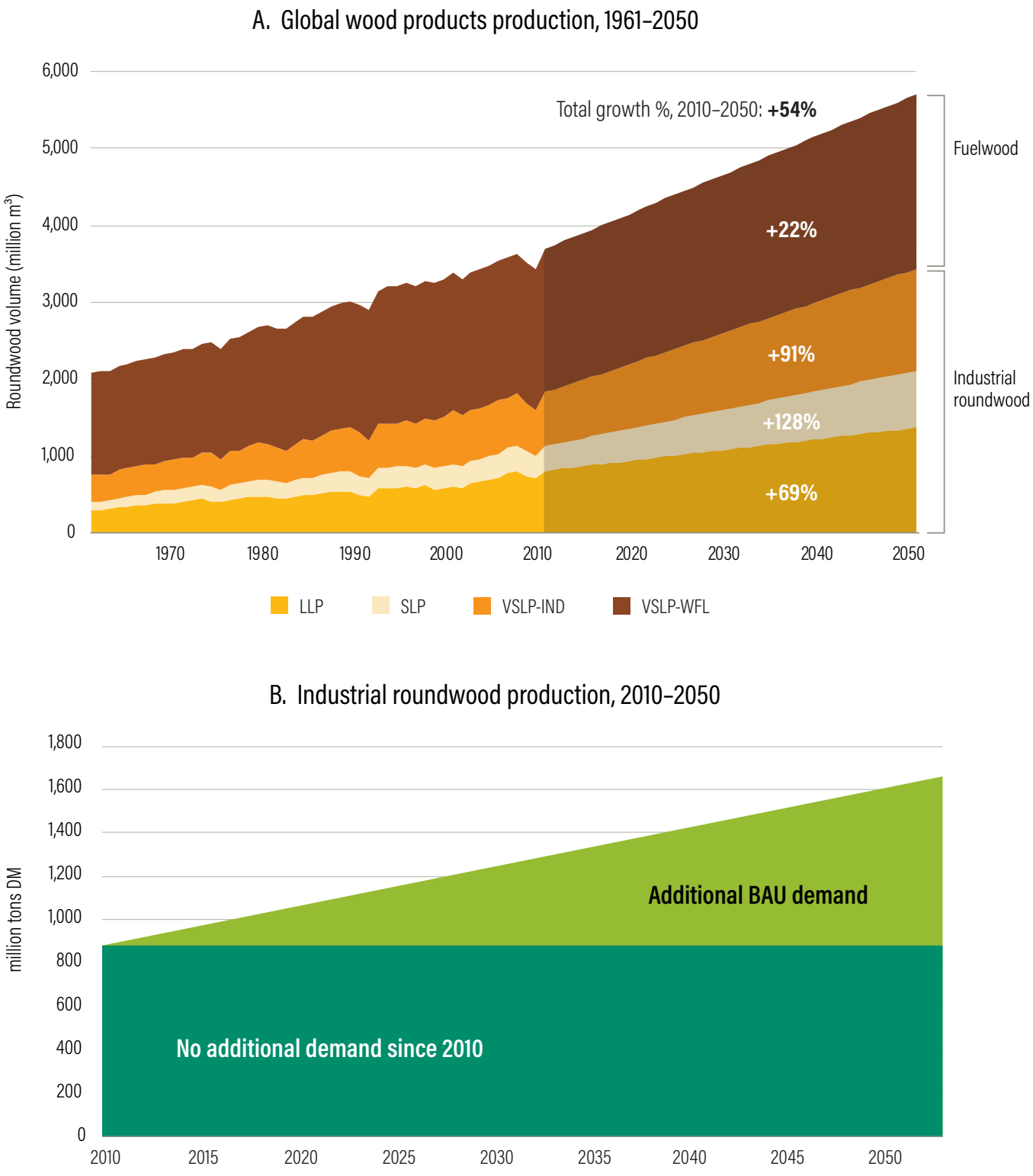
The results of the FE model show that wood consumption generally has a positive relationship with growth in GDP per capita and with population; they also reveal certain time trends that may be used as surrogates for changes in technology (see Appendix A). All the models have reasonable statistical fits, although it is also clear that a number of unobserved factors play roles in wood consumption, which makes future projections uncertain.[11]

Using these relationships established between 1961 and 2020, we project 2050 consumption based on future populations and GDP per capita and factor in time trend factors (Appendix A).[12] Assuming that trade patterns in 2050 remain the same as in 2010, we estimate 2050 production in each country and globally for LLPs, SLPs, and VSLPs.

Using this modeling approach, we project that total annual global wood production and consumption will increase by 54 percent under a BAU scenario (Figure 12A). We project that LLP production will increase by 69 percent, SLP by 128 percent, and VSLP-WFL by 22 percent. Overall industrial roundwood (LLPs, SLPs, and industrial waste) would increase by 88 percent and fuelwood by 22 percent. Assuming linear increases between 2010 and 2050, we also estimate the cumulative additional industrial roundwood production between those dates as 32,912 million m^3, or 15,860 million tons dry matter (Figure 12B).

Our projections are mostly within the range of other published studies (Table 3). For example, Szabó et al. (2009) projected a 243 percent increase in use of paper and paperboard between 2000 and 2030 in Asia and a 200 percent increase in South America. Over a 40-year period from 2010 to 2050, we project a 180 percent increase in East Asia and 249 percent increase in Latin America. FAO (2009) projected that global consumption of sawn wood and wood-based panels would increase by 41 percent and 116 percent, respectively, from 2005 to 2030, whereas our projections are for an 84 percent increase in sawn wood and wood-based panels from 2010 to 2050, which combines both items and covers 40 years rather than 25 years.

Figure 12 | We project 54 percent growth in total wood production between 2010 and 2050 under "business as usual"



Notes: BAU = business as usual; LLP = long-lived product; SLP = short-lived product; VSLP = very-short-lived product. In panel A, the areas between 1961 and 2010 are adjusted historical data, and post-2010 (shaded areas) are projections. Panel B shows the projected growth in BAU of just industrial roundwood production (million tons in dry matter).

Source: Authors.

Table 3 | Comparison of Different Global and Regional Timber Demand Projections

	LONG-LIVED PRODUCTS (LLP)		SHORT-LIVED PRODUCTS (SLP)	VERY SHORT-LIVED PRODUCTS (VSLP)
	Sawnwood	Wood-based panels	Paper and paperboard	Wood fuel
Kangas and Baudin 2003	**2000–2020**			
Europe	+24% (1.2%)	+38% (1.9%)	+50% (2.5%)	
Szabó 2009	**2000–2030**			
Asia			+243% (8.1%)	
Europe			+44% (1.5%)	
North America			+36% (1.2%)	
South America			+200% (6.7%)	
FAO 2009	**2005–2030**			**2000–2020**
Africa	+117% (4.7%)	+67% (2.7%)	+200% (8.0%)	+34% (1.7%)
East Asia and Pacific	+35% (1.4%)	+199% (7.9%)	+157% (6.3%)	–14% (–0.7%)
Europe	+41% (1.7%)	+74% (3.0%)	+78% (3.1%)	+536% (26.8%)
Latin America	+56% (2.3%)	+67% (2.7%)	+94% (3.8%)	+17% (0.9%)
North America	+34% (1.3%)	+64% (2.6%)	+56% (2.2%)	
Western and Central Asia	+77% (3.1%)	+211% (8.4%)	+150% (6.0%)	–30% (–1.5%)
World	+41% (1.6%)	+116% (4.6%)	+105% (4.2%)	
Buongiorno 2015	**2015–50**			
East Asia and Pacific		+71% (2.0%)	+62% (1.8%)	+9% (0.3%)
Europe and Central Asia		+22% (0.6%)	+33% (0.9%)	+9% (0.3%)
Latin America		+40% (1.2%)	+52% (1.5%)	+8% (0.2%)
Middle East and North Africa		+65% (1.9%)	+49% (1.4%)	+9% (0.3%)
North America		+14% (0.4%)	+29% (0.8%)	+9% (0.3%)
South Asia		+138% (3.9%)	+137% (3.9%)	+5% (0.2%)
Sub-Saharan Africa		+48% (1.4%)	+100% (2.9%)	–13% (–0.4%)
World		+46% (1.3%)	+52% (1.5%)	+1% (0.0%)
This report	**2010–50**			
East Asia and Pacific		+177% (4.4%)	+180% (5.6%)	+5% (0.1%)
Europe and Central Asia		+22% (0.5%)	–7% (–0.2%)	–9% (–0.2%)
Latin America		+110% (2.7%)	+249% (6.2%)	+8% (0.2%)
Middle East and North Africa		+169% (4.2%)	+338% (8.5%)	+38% (0.9%)
North America		–28% (–0.7%)	+3% (0.1%)	5% (0.1%)
South Asia		+277% (6.9%)	+904% (22.6%)	+18% (0.5%)
Sub-Saharan Africa		+317% (7.9%)	+436% (10.9%)	+49% (1.2%)
World		+84% (2.1%)	+128% (3.2%)	+22% (0.5%)

Note: The linear annual growth rate (percentage per year) is in parentheses.

Source: Authors

Buongiorno (2015) projects that the world is likely to demand about 50 percent more industrial roundwood by 2050 relative to 2010, lower than our estimated 88 percent increase. Compared to Buongiorno (2015), we project similar changes for LLPs in Europe and North America, but much higher growth rates in other regions. One explanation may be that we use more recent, higher projections of GDP per capita and population growth rates (rising to 9.7 billion rather than 9.3 billion in Buongiorno [2015]). We also use a fuller length of historical data (1961–2020). Buongiorno (2015) used the shorter period of 1992–2012, which ended in years of recession with depressed wood use. Compared to that study, we also project a larger increase in paper consumption in Africa, Asia, and Latin America and a similar increase in Europe and North America.

Our projection of 22 percent in direct use of wood for fuel compares with only 1 percent in Buongiorno (2015). Fuelwood use has the least consistent relationship with growth in population and GDP per capita. China, for example, mostly shifted from fuelwood to fossil fuels despite a relatively low per capita income, but low-income African countries have continued to rely primarily on fuelwood. Because of this variation, and because future fuelwood use will depend greatly on government energy policies, we consider our fuelwood projection (and any fuelwood projection) to be the least reliable of overall wood consumption projections.

Although our model has reasonably good statistical fits, it is clear that wood consumption depends on many unknown variables, and future wood consumption is likely to depend on factors that cannot be predicted with present information. One unknown is the effect of changing technologies. For example, Hurmekoski and Hetemäki (2013) argued that the structural change driven by digital information technology around 2000 has had large downward impacts on paper demand. Studies using data before 2010 cannot account for these trends and therefore could not project the effects of changing technology. On the other hand, more than 50 percent of paper products are used for packaging (FAO 2020a), and the global rise of internet shopping could fuel increases in paper used for packaging (Chiba et al. 2017). Another uncertainty is possible constraints on supply. In Buongiorno's (2015) model, projected wood price increases depress growth in future wood consumption. These price increases may occur, but to our knowledge, there is no good econometric analysis of the long-term supply and demand elasticities with which to project future wood prices.

Despite these uncertainties, wood demand will likely increase for the same reasons food demand will increase. One reason is that the population is growing. Another is that most of the people in the world consume far less sawn wood and far fewer wood panels and paper products than the world's wealthy. Assuming incomes grow in developing countries, demands for this wood are likely to increase and have the potential to do so in vast quantities.

3.5 Implications of Future Wood Demand Growth on Land-Use Competition

A 54 percent global increase in wood demand between 2010 and 2050 will add to global land-use competition. New plantation forests and agriculture will likely compete with natural land uses, and efforts to harvest forests will likely compete with efforts to leave them unharvested to store more carbon and support more biodiversity. To estimate the overall land-use requirements and carbon implications, we constructed a biophysical accounting model, described in Appendix A, which we call the Carbon Harvest Model (CHARM). To count land use, as others have sometimes done (Ager and Clifton 2005), the model counts clear-cut-equivalent hectares, which estimate the hectares required to produce a quantity of wood assuming the wood comes from a clear-cut. A substantial portion of wood harvests occur through some form of selective harvesting. Because selective harvesting generates less wood per hectare harvested, counting selectively harvested area would increase our estimates of land-use requirements. But knowledge of how much wood is harvested with different forms of selective harvesting in different countries is too incomplete to model globally or even nationally.

Because different forest types and forest management systems could meet rising future demand, we applied the model to different scenarios for meeting future wood supply. For example, harvesting more wood could occur through additional harvests of natural (secondary) forests, which are then allowed to regrow natural vegetation. Alternatively, such harvested forests could be replaced by faster-growing timber plantations. Wood might also be supplied by establishing timber plantations on areas currently in agriculture (assuming that agricultural land could be "liberated" from production through shifting diets, reductions in food loss and waste, and/or sustainable intensification). To explore the various options, we analyzed seven scenarios based on different ways of supplying the needed wood, which are designed to bound the potential results. For example, scenarios that involve converting harvested secondary forests to plantations represent an extreme form of using management intensification to meet rising wood demand (relative to other possible management changes in secondary forests). We also incorporate a scenario with 25 percent increases in plantation forest yields to explore the potential effects of "improved management."

Each scenario assumes that the roughly 200 Mha of existing planted forests in 2010 continue to produce wood at their present typical rotation rates (based on our best estimates of national average rotation rates) and assumes that these areas are fully harvested. We incorporate present estimates of quantities of wood from live vegetation that is killed by the harvest but left unharvested, also referred to as slash. We assume harvested wood is available to meet each of the different types of demand: LLP, SLP, and VSLP. In theory, supplying wood for some uses could become unrealistic because of the different types of wood needed for different uses, but through a combination of trade and our projections for relatively balanced growth in demand for different types of wood products, this assumption is reasonable for this type of analysis.

Our seven scenarios are as follows:

- **Scenario 1 (secondary forest harvest and regrowth)** assumes that the existing plantations are supplying wood at our best estimate of their present growth rates. Additional wood demand is met by the harvesting wood from middle-aged secondary forests, and the forests are allowed to regrow for 40 years. This scenario also assumes that all wood is supplied by at least small clear-cuts, and it measures the area of such clear-cuts.
- **Scenario 2 (secondary forest harvest and conversion)** assumes that the existing plantations are supplying wood at present growth rates and that after secondary forest areas are harvested as in Scenario 1, they are reestablished as plantations (assume at productive locations with at least the present growth rates of secondary forests) to maximize the amount of future wood supplied by plantations. Plantations have substantially higher outputs of wood per hectare per year and are typically harvested more efficiently than natural forests, which means that more of the wood felled is used as wood products. This scenario is designed to examine how much harvest area could be held down by using intensive management.

  Although we assume that the same lands are replanted as plantations, something similar to this scenario would also occur if natural forests continue to be cleared for agriculture in one location while plantations are established on abandoned agricultural land in others. In China and many European countries, as discussed above, the large-scale conversion of less productive agriculture lands to wood plantations is associated with a heavier reliance on imported foods that contribute to large deforestation in Latin America (Pendrill, Persson, Godar, Kastner, et al. 2019). On a global basis, in effect, natural forests are being converted into plantations, although those plantations actually occur at a different location than the clearing of natural forest.
- **Scenario 3 (secondary forest mixed harvest)** is similar to Scenario 1 except that 50 percent of wood demand is provided by middle-aged secondary forests and 50 percent is provided by mature secondary forests (growing for 40 more years than middle-aged secondary forests). Slash rates for both secondary forests are the same.

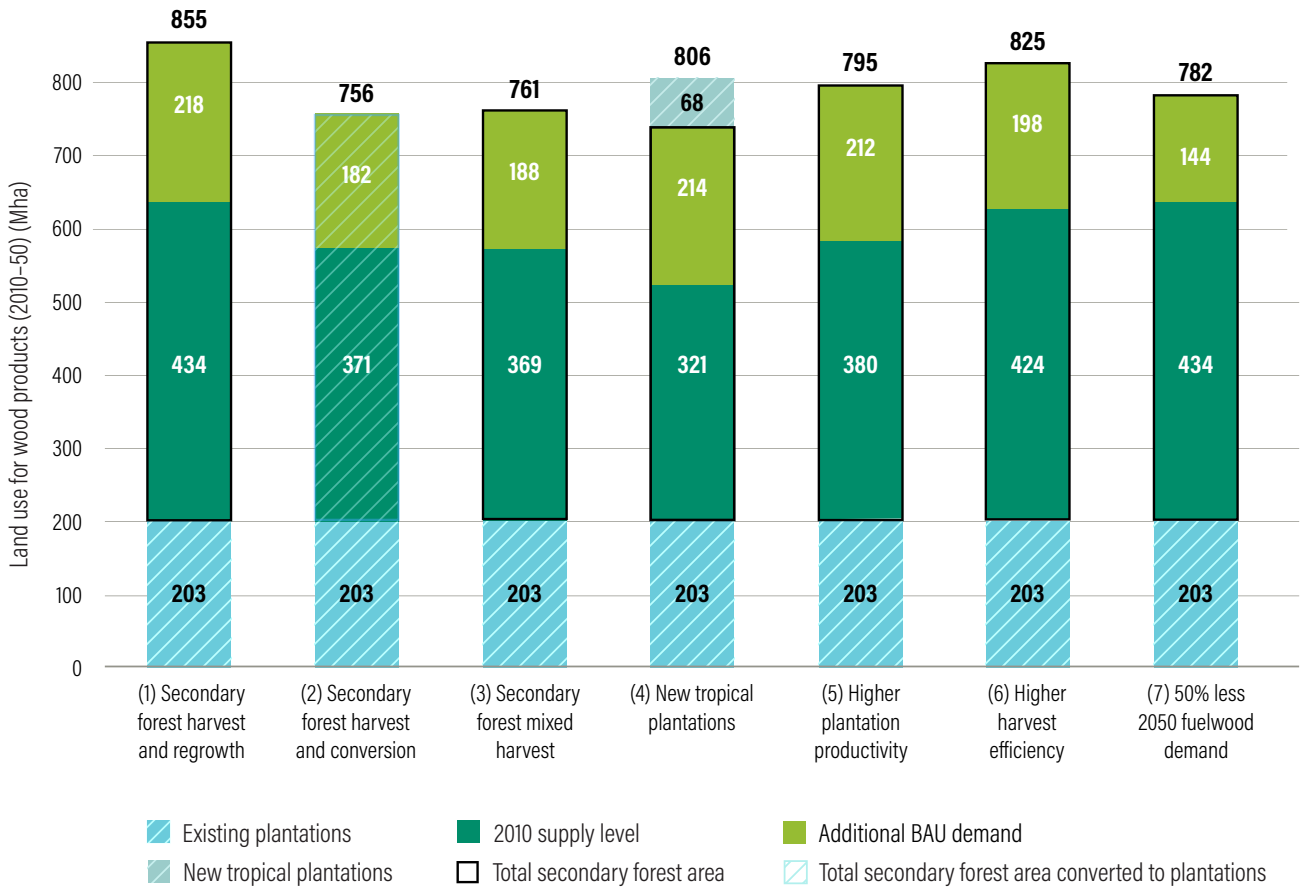
- **Scenario 4 (new tropical plantations)** assumes that 68 Mha of tropical agricultural lands become available for establishing highly productive plantations in the tropics and are harvested evenly between 2020 and 2050 (2 Mha/year since the first harvest occurs after 10 years). All new plantations are located in existing agricultural lands in the tropics and neotropics, where forest yields are higher. The secondary forests are harvested less due to the wood supply from the new tropical plantations. This scenario assumes that these lands are no longer needed to produce food, so although regrowing these lands as plantations sequesters carbon, the carbon cost is not allowing these lands to regrow as secondary forests.
- **Scenario 5 (higher plantation productivity)** is identical to Scenario 1 but assumes that existing plantation forest growth rates increase by 25 percent between 2010 and 2050.
- **Scenario 6 (higher harvest efficiency)** is identical to Scenario 1 but assumes that existing tropical secondary forest harvest efficiency increases so that the slash rate reduces to the level of best practices as described by Ellis et al. (2019).
- **Scenario 7 (50 percent less 2050 fuelwood demand)** is a variant of Scenario 1, in which fuelwood demand in 2050 reduces by half compared to the demand for fuelwood under BAU. It is based on optimistic views of energy transitions in developing countries.

Table 4 | Summary of Seven Global Scenarios Analyzed in CHARM to Meet Future Wood Demand

SCENARIO NAME	DESCRIPTION OF SOURCES OF WOOD	ADDITIONAL ASSUMPTIONS
(1) Secondary forest harvest and regrowth	Existing plantations and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands
(2) Secondary forest and conversion	Existing plantations and secondary forest harvest and then converted to productive plantations	The portion of wood supply from secondary forests is 100% from middle-aged stands
(3) Secondary forest mixed harvest	Existing plantations and secondary forest mixed harvest and regrowth	The portion of wood supply is 50% from middle-aged and 50% from mature secondary forest
(4) New tropical plantations	Existing plantations, secondary forest harvest and regrowth, and tropical agricultural land gradually converted to plantation	Rotation length of new tropical plantations is 7 years; 2 million hectares per year of tropical agricultural lands are converted to plantations each year
(5) Higher plantation productivity	Existing plantations with 25% increase in plantation growth rates and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands
(6) Higher harvest efficiency	Existing plantations with 25% increase in plantation growth rates and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands
(7) 50% less 2050 fuelwood demand	Fuelwood demand decrease linearly to reach 50% of 2050 baseline demand, existing plantations, and secondary forest harvest and regrowth	The portion of wood supply from secondary forests is 100% from middle-aged stands

These scenarios are intended to collectively bound the potential land-use and carbon costs of meeting growing wood demand, although none of these pure scenarios may be likely by itself. For example, Scenario 2, which relies more heavily on plantations, would require some shifts in the types of wood used. Most hardwoods would be eliminated (probably with some limited supply coming from hardwood plantations, such as teak plantations), and wood would be supplied mostly by fast-growing trees. In temperate areas, such production would be dominated by fast-growing pine species, and eucalyptus, acacia, and bamboo would dominate plantations in tropical and neotropical areas. This scenario would probably require continued evolution of wood product manufacturing technologies to make more use of fast-growing trees. Scenario 4 requires sufficient dietary changes or increases in agricultural outputs per hectare to free up land to establish forest plantations without triggering land-use change elsewhere. Scenario 5 requires large increases in plantation forests either through more intensive management or new tree varieties. Scenario 6 relies on reducing the amount of felling and destruction of other trees during tropical wood harvests to reduce the overall slash rate. Scenario 7 assumes sufficient technology breakthroughs or income growth to greatly reduce wood energy demands in the developing countries that rely on fuelwood. We suspect future wood

Figure 13 | We project 756-855 Mha of wood harvest (clearcut equivalent) for 2010–2050



Notes: BAU = business as usual. Because the quality of data is less reliable from countries with limited forestry, these global results sum up country-level estimates from the top 30 wood-producing countries that collectively generated 80 percent of production in the 2010 baseline. To scale up from 80 percent to 100 percent of production, we divided the total from the 30 countries by 0.8, which assumes the global average level of land-use efficiency for the remaining 20 percent of production. We also assumed linear phasing in of additional wood demand from 2010 to 2050.

Source: Carbon Harvest Model.

supply will likely result from some mixture of these scenarios, although only sweeping policy or technology changes are likely to result in reductions in agricultural land. Our results therefore show a good range of possible outcomes.

Figure 13 presents the results. The bars show the quantity of land (in Mha) we estimated that would be needed to supply wood products between 2010 and 2050 under our seven different scenarios. The bars show the existing plantation area in 2010 (bottom diagonal lines), the area that would be needed just to maintain the 2010 wood supply if it remained constant to 2050 (dark green), and the additional area needed to meet BAU-projected demand by 2050 (light green).

Scenario 1 shows that meeting projected wood demand in 2050 without expanding plantation areas beyond the 2010 level would require harvesting ~850 Mha of forest between 2010 and 2050, including about 200 Mha of existing plantations and 650 Mha of secondary forests. Harvesting ~430 Mha of secondary forests (53 percent of total harvested area) would be needed to maintain the 2010 wood supply level, and an additional ~220 Mha of secondary forest (51 percent) would be necessary to meet the growth in BAU wood demand to 2050. Instead of harvesting the middle-aged secondary forests only, supplying 50 percent of the additional wood demand from older secondary forests (Scenario 3) would reduce the amount of total secondary forest needed from 650 Mha to 557 Mha because older forests produce more wood with the same hectares.

Scenarios 2 and 4 show that less additional land would be needed if plantation areas increased between 2010 and 2050 because multiple harvests over the 40 years mean that more wood could be produced on fewer hectares. Reestablishing the secondary forests harvested with plantations (Scenario 2) would reduce the amount of total secondary forest needed from 650 Mha to 553 Mha. Establishing plantations on tropical agricultural land at average efficiencies of the high-yielding tropics (Scenario 4) would reduce the land area needed beyond the 2010 plantations to 603 Mha (535 Mha of secondary forests and 68 Mha of new plantations).

Scenarios 5–7 show that productivity increases and technology shifts could help reduce the land area needed. Increasing plantation growth rates by 25 percent (Scenario 5) would reduce the amount of total secondary forest to 592 Mha. Increasing the harvesting efficiency in tropical forests (Scenario 6) would reduce the the amount of total secondary forest to 622 Mha. Decreasing 2050 demand for fuelwood by 50 percent (Scenario 7) would reduce the amount of total secondary forest to 579 Mha.

We found limited other literature providing estimates of land demands from increases in wood demand, but our results appear consistent with those of some other researchers. For example, the World Wide Fund for Nature (WWF 2012) examined scenarios involving a tripling of wood demand and projected that between 242 Mha and 304 Mha of additional natural forest would need to be managed for commercial harvesting by 2050 relative to 2010 (compare this to the light green solid bar in Scenario 1 in Figure 13, with 218 Mha), along with a need for 250 Mha of new tree plantations to be established between 2010 and 2050 (compare this to the light green solid bar in Scenario 2, with 182 Mha). Although these scenarios are not directly comparable with our scenarios, the sum of 304 Mha and 250 Mha is similar to the orders of magnitude of our estimates.

3.6 Implications of Future Wood Demand Growth on Carbon

The additional wood harvests to meet the growth in wood demand between 2010 and 2050 will have substantial implications for carbon and thus for climate impacts. We use CHARM to provide an estimate of these effects that reflects the time-discounted value of earlier rather than later mitigation—or, put another way, that counts early emissions more than later emissions. We also use the model to estimate the net effect on carbon 40 years after each harvest.

Although papers use a wide variety of approaches to account for the GHG costs of forestry, they typically present their results with little discussion or explanation of the method they use (Ter-

Mikaelian et al. 2015). For this paper, we reviewed more than 60 previously published studies (Appendix B) on the climate implications of forestry and wood demand.

Probably the most common approach in the literature to date has been to treat wood harvesting as carbon neutral so long as forests are harvested "sustainably." *Carbon neutral* means that the carbon lost from the forest and emitted to the air as wood decomposes or is burned is not counted as an emission. This is the approach followed for nearly all analyses of the carbon implications of construction timber or other LLPs (Appendix B), and the approach followed in the vast majority of papers finding GHG benefits from harvesting wood for bioenergy (see Ter-Mikaelian et al. 2015; Haberl et al. 2012). *Sustainable forest management* can mean many things, including just practices that allow forests to regrow, and it is often not defined. In its strongest formulation, the term *sustainable forest management* is used to mean that the harvest of forests does not exceed the annual growth of the forest, so that overall existing carbon stocks of the whole forest are maintained. This quantity is sometimes referred to as the "sustainable yield."

Under this approach, if all the world's forests were viewed as one forest, it is possible to view global forest harvests as having no GHG effect because forests are gaining carbon globally. That carbon gain is occurring through a combination of regrowth of previously cut forests and carbon dioxide fertilization and other climate effects. However, if forests were going to gain carbon without new harvests, then harvesting wood in an amount that keeps wood and carbon stocks in the forest the same reduces the forest carbon that would otherwise have been stored. European forests, for example, are increasing in wood and therefore carbon content for a variety of reasons. These reasons include agricultural abandonment (spurred heavily by a reduction in horses and other draft animals)[13] and a variety of biophysical effects primarily linked to increased carbon dioxide and other effects of climate change (Ciais, Schelhaas, et al. 2008; Le Noë et al. 2019). Among other effects, an accounting approach that treats "sustainable" wood harvesting as carbon neutral treats the near-term elimination of the forest carbon through wood harvesting as having no climate consequence even though that sink is critical to restraining climate change (Schimel et al. 2015).

This assumption of carbon neutrality, applied to particular harvests, has similar consequences to that of counting the climate impacts of a country's forestry by netting the effect of new harvests with regrowth from forests cut longer ago (Box 2). In both cases, the accounting reduces the apparent carbon consequences of the new forest harvest by crediting it with carbon uptake in forest regrowth that either did occur or would have occurred anyway and therefore cannot be considered a consequence of harvesting forests more today.

Another approach seen in the literature is to compare an unharvested forest with the average carbon stock of a forest under regular harvest. In other words, if an unharvested forest would have 100 tC, but it is cut and regrows until harvested again at 100 tC, then the average carbon stock held by each hectare of forest may be around 50 tC. This approach could accurately represent the average amount of carbon over time (although there are concerns with whether repeat harvesting can maintain growth rates and soil carbon). Assuming that forests are allowed to regrow, this approach factors in that regrowth. But this approach makes no allowance for the value of time and therefore does not account for the importance of restraining carbon emissions and warming in the short to medium term.

Although these approaches lead to relatively low estimates of the climate impacts of forestry, there are also papers that focus on the gross carbon costs of harvesting wood and that count the losses of carbon in the forest without factoring in future regrowth (Houghton and Nassikas 2018; Ellis et al. 2019). Using such an approach, for example, Pearson et al. (2017) estimated 2.1 $GtCO_2$ per year from forest degradation (rather than conversion), of which 83 percent was due to wood harvests.

Our forestry carbon accounting approach, based on the framework established by Schlamadinger and Marland (1996), starts from the logical fact that harvesting wood today removes carbon from

the forest but that the accounting must also factor in the benefits of regrowth. If never harvested, forest growth rates decline over time, so regrowing forests, typically a few years after harvest, can grow faster and rebuild carbon stocks. This regrowth benefit must be factored in. This accounting must also recognize that harvested carbon is not emitted to the air immediately. It persists for highly varying times in different carbon pools, including slash, the different product categories (LLP, SLP, and VSLP), and in landfills. If forests are harvested again, there will be a continuously lower average carbon stock in the forests versus if they are left alone to grow. But if the world values immediate reductions in carbon, then the carbon costs of harvesting wood are higher than even the change in average carbon stocks in the forest over time. The immediate carbon loss to the atmosphere means more carbon in the atmosphere for decades before regrowing forests can reabsorb most of the carbon lost by the harvest.

Counting the loss of carbon due to additional harvests does not require the assumption that any particular hectare would remain unharvested, only that some forests would otherwise remain unharvested. Highly managed forests are likely to be cut at some point, but they are cut to meet forest product demand. What matters is the aggregate demand, and if that demand increases, some more forests must be cut somewhere. In the same way, the gallon of gasoline any one person pumps from a gas station would almost certainly be pumped by another, but that does not make using gasoline carbon neutral. Life cycle analyses are generally focused on increases or decreases in aggregate consumption.

We show results using two approaches to time. One is simply to count the effect on carbon in the atmosphere 40 years after harvest. The other is to use a time-discounting approach that uses a 4 percent annual discount rate, as in Searchinger, Wirsenius, et al. (2018). With such an approach, a ton of carbon withheld from the air in year one is worth 4 percent more than a ton of carbon withheld from the air in year two. Similarly, a ton of carbon added to the air in year one counts 4 percent more than a ton of carbon added to the air in year two. The reason is not that the carbon is more potent in one year than the next but that we value the carbon emissions (and therefore mitigation) differently based on the time this carbon is added (or removed) from the air and use a discount rate to reflect this difference. One obvious reason to assign higher costs to carbon added to the air early, even if removed later, is that it causes damage in the intervening years. Another reason is the desire to reduce emissions immediately, which reduces the risk of crossing tipping points and therefore provides time for technology to evolve and drive down the costs of achieving the necessary full-scale mitigation. As shown rigorously in Daniel et al. (2019), if the world wants to "buy time" to address climate change in this way, it should pay more to mitigate emissions in the short term rather than in the long term.

As discussed in Searchinger, Wirsenius, et al. (2018), a 4 percent discount rate can also be justified if we assume a constant carbon price (that the economic cost of emissions and therefore the economic value of mitigation is equal over time) while using a commonly estimated long-term cost of capital. In addition, discounting carbon changes from terrestrial vegetation by 4 percent generally results in an equivalent result to amortizing emissions over slightly more than 30 years, which is roughly consistent with U.S. government policies for biofuels, which also effectively amortize emissions from land-use change over 30 years. Because discounting focuses effects on 30-year results, this approach is generally consistent with the actual policies endorsed by most of the world's countries through the Paris Agreement, which also aim to achieve vast reductions in emissions by 2050. Appendix C provides some additional explanation and illustration of how the discounting calculation works. As shown in Appendix C, however, the carbon effect factoring in 40 years of regrowth after each harvest changes little using any number from a 2–6 percent discount rate.

CHARM can also calculate carbon "saved" in fossil fuels kept underground or in limestone by substituting wood for other fossil fuel–intensive products, such as steel and concrete used in construction. Many parameters are uncertain, but Appendix A describes the critical parameters used and their sources. (Box 4 describes how disturbance and thinning are addressed.)

BOX 4 | The Effects of Management on Disturbance and Growth Rates

The scenarios analyzed in the Carbon Harvest Model (CHARM) essentially assume two main forms of management: secondary forest harvest and regrowth and plantation management. Disturbance is implicitly factored in because our estimated growth rates for each country (or forest type) borrow from studies that attempt to assess them in the real world, where they are affected by disturbance. We also factor thinnings into our stand-level analyses, but because of data limitations in our global analyses, thinnings are only implicitly incorporated into the analysis through their effects on overall harvest levels and growth rates.

One question is what other effects management may have on growth rates and carbon stocks. Although the results will vary and the literature does not show only one effect, as a general rule, more intensive plantation management is more likely to result in additional carbon losses.

Despite variability,[a] the weight of existing science is generally that intensively managed plantations are more susceptible to disturbance than more natural forests.[b] That is partially because older trees are less susceptible to fire.[c] Studies also generally find that heavily managed (thinned) monocultures are more susceptible to both wind damage and pests.[e] Some forms of management are ambiguous, however.[f] For example, the intensive removal of weeds and underbrush can reduce resilience of a stand to winds[g] and provide opportunities for increased herbivory,[h] but leaving excess biomaterial can provide shelter for other types of pests[i] and can increase the risk of fire.[j] Fresh stumps and logging scars from thinnings might also be conducive to infection from tree diseases and increase the risk of fire if they create slash left in the forest.[k] However, thinnings that reduce the crown volume might improve resilience to fire.[l]

European plantation forests, which compose a large share of European forests, provide an example of the risk faced by some kinds of forest management. Beetle infestations, at a minimum exacerbated by climate change, are causing extensive damage, and there is an emerging view that European forests will need to be diversified to increase the percentage that can survive climate change.[m]

Thinning is sometimes suggested as another strategy to increase carbon sequestration. In general, thinnings boost the percentage of a forest's growth directed into harvestable trees, mostly due to reduced competition for water resources in arid and semiarid regions following a thinning.[n] However, the evidence is also strong that thinning will tend to reduce overall carbon stocks and total plant growth by reducing the leaf area that intercepts light and the roots that can absorb water and other nutrients.[o]

Sources: a. Felton et al. 2016; b. Reyer et al. 2017; c. Botequim et al. 2013; González et al. 2007; d. Valinger and Fridman 2011; e. Björkman et al. 2015; f. Jactel et al. 2009; g. Gardiner et al. 2005; h. Black 1992; Brandeis et al. 2002; i. Björklund et al. 2003; j. Rothermel and Philpot 1973; k. Fettig et al. 2007; Peterson et al. 2005; l. Agee and Skinner 2005; m. Hlásny et al. 2019; n. Olivar et al. 2014; Giuggiola et al. 2013; Sohn et al. 2013; o. Hoover and Stout 2007; Lin et al. 2018.

Here, we present the carbon impacts of forest harvest in $GtCO_2e$ while maintaining 2010 levels of supply and projected increases under BAU scenarios (Figures 14 and 15). We estimate that the harvests and uses of wood causes time-discounted gross emissions from forests affected by harvesting from 3.5–4.2 $GtCO_2e$ per year. (This estimate ignores the indirect effects on adjacent forests, which, according to some analyses, may be many times greater.)

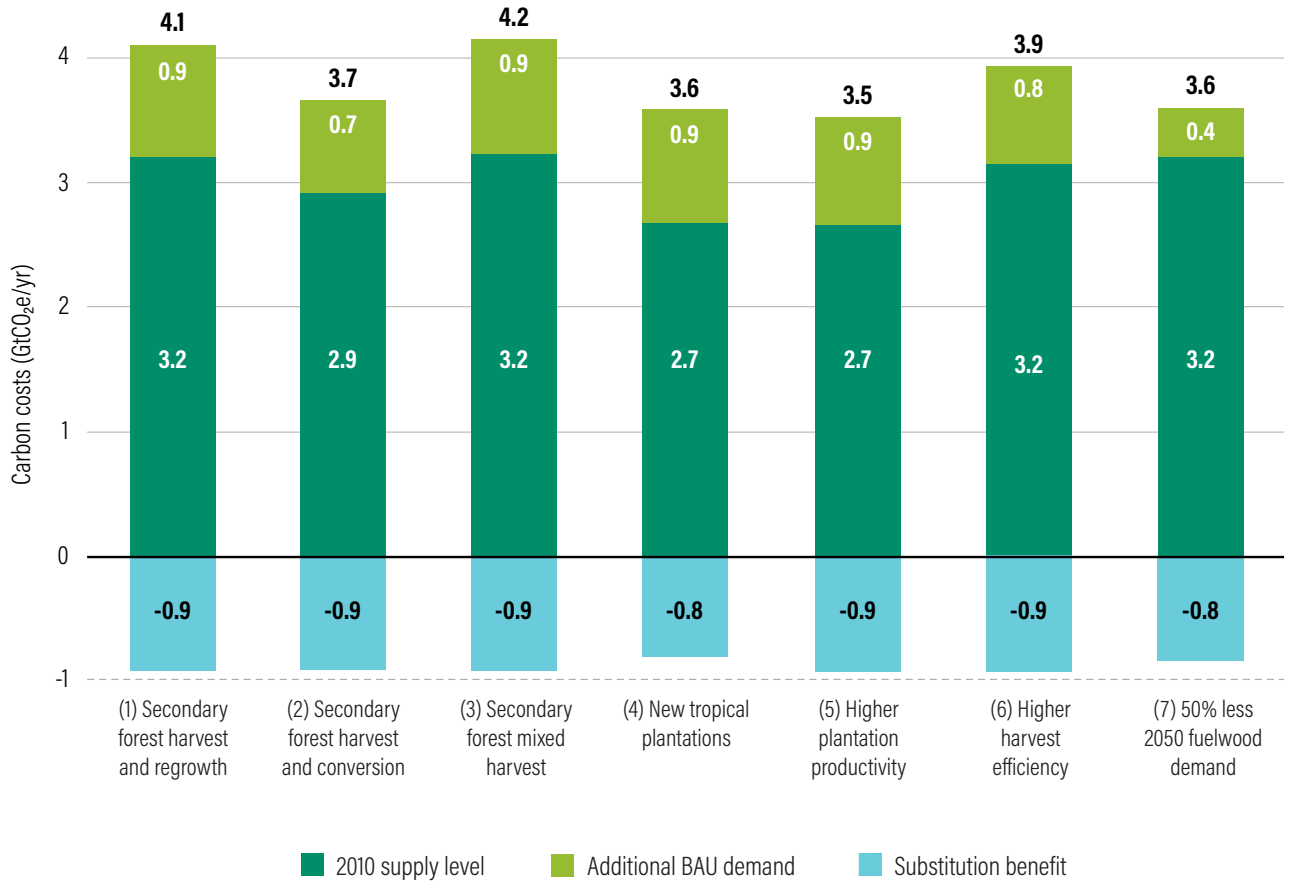
We also estimate results factoring in emissions savings from substituting wood for other products.

The emissions from wood use related to harvesting are real physical additions of carbon to the atmosphere, even if using wood can avoid even greater emissions from using concrete and steel. In the same way, emissions from burning natural gas are real: even if they are lower than burning coal, we do not claim that natural gas has negative emissions. Although wood emissions physically occur, knowing if they save emissions from other substances can also be relevant for public policy.

Our estimate of substitution benefits uses an average emissions savings estimate from different studies that result from using wood for construction rather than concrete and steel (an estimated 1.2 tC saved for each ton of carbon in wood used in construction). We discuss this substitution factor more below. Our substitution estimates also factor in a bioenergy savings for using traditional fuelwood in place of fossil fuels. The vast majority of this wood is used for cooking in developing countries. Although the alternative might really be no energy at all, we assume it would be the use of propane gas. The result is that for 5.7 tC emitted from burning fuelwood saves 1 tC that would be emitted by propane.[14] Including these avoided emissions in our model reduces the calculated global carbon impact by about 0.9 $GtCO_2e$ (25 percent) in each scenario and does not impact whether regrowing secondary forests or converting them to plantations is more favorable. For example, when crediting substitution benefits, the annual carbon cost of forestry using the secondary forest harvest scenario decreases from 4.1 $GtCO_2e$ to 3.2 $GtCO_2e$.

Due to insufficient data, we do not calculate an overall substitution value for other wood uses, which may be negative—that is, there may be net emissions by using wood instead of other materials.

Figure 14 | We estimate 3.5–4.2 Gt per year of present discount value carbon costs from global wood harvest (2010–2050) with roughly 0.9 Gt per year benefit from replacing concrete and steel



Notes: BAU = business as usual. Positive values indicate emissions; negative values indicate avoided emissions. Substitution benefits assume that 64 percent of long-lived products are used for construction and replace concrete and steel at a rate of 1.2 tons of carbon for concrete and steel per 1 ton of carbon for wood. Gross carbon costs (emissions) are without substitution savings (avoided emissions) from concrete, steel, and bioenergy. Costs are discounted carbon changes from year of harvest to 40 years later discounted to year of harvest.

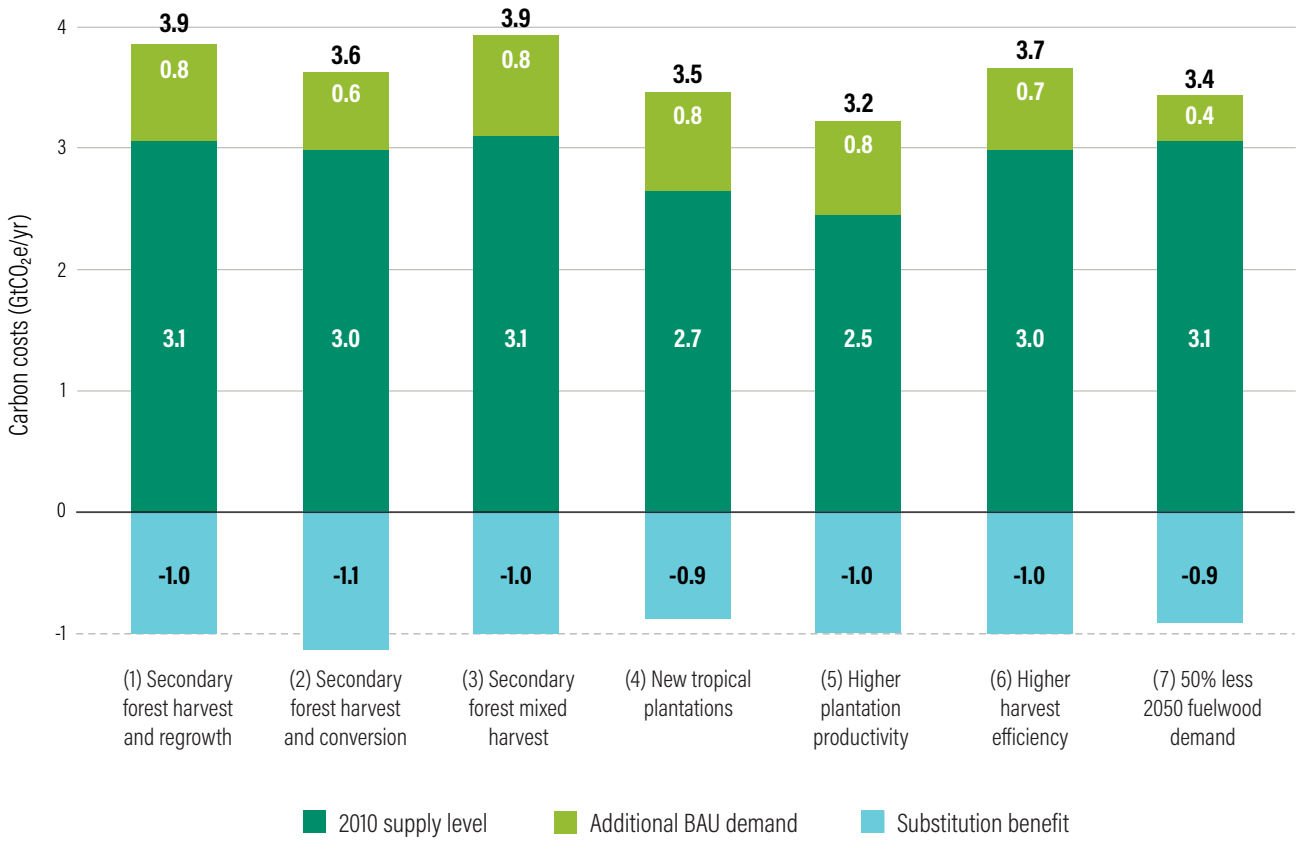
Source: Carbon Harvest Model.

Burning of waste wood generated in making paper and other wood products generates energy, including often electricity. In general, however, although paper mills often generate some electricity and sometimes heat that they sell to others, paper mills typically use more fossil fuel energy than they replace (Miller et al. 2015). Because of uncertainties regarding global energy use for sawmills, wood panel processing, and bioenergy uses overall, we have not attempted to include these additional energy costs or savings from wood waste.

Although our main analysis uses discounting, the results are surprisingly similar to the carbon effects of forestry on atmospheric carbon 40 years after harvest without any discounting at all (illustrated in Figure 15 and Appendix C by the 0 percent discount rate). For example, in our BAU "secondary forest harvest scenario," the gross change in carbon in the atmosphere after 40 years due to harvesting of wood is slightly lower without discounting at 3.9 $GtCO_2e$ per year versus almost 4.1 with discounting. (Including substitution benefits reduces those post-40-year undiscounted carbon costs to 2.9 $GtCO_2e$ versus 3.2).

The reason for this small difference is that the climate benefits and costs of harvesting wood are fairly dispersed over the first 40 years. Much of the carbon loss occurs in the first years after harvest as wood is burned, slash decomposes rapidly, and paper products are quickly consumed.

Figure 15 | We project 3.2-3.9 Gt annual carbon costs (2010–2050) 40 years after harvest without discounting with roughly 1 Gt substitution benefits for concrete and steel



Notes: BAU = business as usual. Positive values indicate emissions; negative values indicate avoided emissions.

Source: Carbon Harvest Model.

But much of the wood is also preserved in some other carbon pool in the first years as well, and the substitution benefits (from the replacement of concrete and steel) occur immediately, canceling out much of the costs.

If we were to focus on carbon effects much longer than 40 years after harvest—for example, 100 years—discounting would have a more significant but still not vast effect. The difference varies by scenario. In our secondary forest harvest scenario, the results are around 3 percent lower than the results we show for discounting over 40 years (Appendix Figure E-1). (In this 100-year discounting scenario, secondary forests are allowed to keep growing either if cut in the harvest scenario or not cut in the counterfactual, and existing plantations continue to be harvested according to their rotation length.) Discounting has a modestly greater effect because unharvested forest growth rates slow down more as they age, allowing newer forests a greater capacity to catch up. This statement is another way of saying that because of forest regrowth, the change in carbon in the air due to harvesting wood 100 years after the harvest is modestly less than it is after 40 years.

There is substantial uncertainty regarding many of the factors that go into this analysis. Uncertainties include rates of slash, including the damage to unharvested trees during harvesting, the relative energy use in making wood products for construction versus concrete and steel, and the shares of wood that go into different product uses. Reconciling FAO data from different categories of wood production and use is also challenging and requires some assumptions and adjustments. The growth rates of different forests are also important, particularly the relationship between forest growth in earlier decades after establishment versus later decades. There is also some uncertainty and debate regarding the quantity and carbon impacts of fuelwood harvests (Box 5). We rely primarily on growth rates estimated in Harris et al. (2021), but that paper did not need to differentiate growth rates from forests of different age classes older than 20 years, and some of its growth rates are implausibly low or high. We made some adjustments, but improvements in the data used for all of these parameters would contribute to an improved analysis.

BOX 5 | Fuelwood Harvests and Carbon

Wood harvested deliberately for fuel is roughly half of all wood harvested (in addition to the wood burned as a by-product of making other wood products), and the majority of those harvests occur in developing countries. Fuelwood is more than 50 percent of wood consumption in Latin America, more than 60 percent in Asia, and more than 90 percent in Africa.[a] The literature expresses different views about its effects on forests carbon.

For example, a report by the United Nations Environment Programme (UNEP) about fuelwood in Africa claims that "fuelwood is usually collected from trees and dead wood and its impacts on forest stocks and climate change may not be significant" while expressing somewhat more concern about charcoal.[b] In India, studies have estimated that trees on farms provide two-thirds of the fuelwood.[c]

Yet other studies have found that even in India, the harvest of remaining forests contributes significantly to degradation and to the net loss of carbon in forests.[d] In Africa, the majority of wood harvests come from forests or woodlands of some kind, and numerous studies have found resulting forest degradation in different countries.[e] One impressive study, which uses a combination of remote-sensing methods, found high forest degradation in African woodlands despite the fact that fuelwood composes more than 90 percent of wood consumption.[f] Using bookkeeping methods,[g] another paper estimated that firewood harvests were responsible for roughly one-third of the carbon losses in tropical forests due to forestry overall.

One reason for these competing viewpoints is the assumption—implicit, for example, in the UNEP report—that the only important problem is full deforestation (i.e., the complete loss of forest), rather than carbon losses through degradation. Another paper takes the approach of only counting emissions due to unsustainable wood harvesting, which means harvests in excess of local forest growth rates. This paper estimates fuelwood emissions at 1–1.2 gigatons of carbon dioxide equivalent per year.[h] As explained above, under our approach, as in Chidumayo's 2013 paper,[i] carbon losses include the forgone increases in forest carbon due to fuelwood harvests.

There are also important uncertainties regarding the land-use and carbon effects of traditional fuelwood harvests, including how much of this fuel harvest uses dead wood and what slash rates are created. Another question is how much fuelwood is provided by trees on farms; whether those trees enhance, coexist, or compete with food production; and whether they are planted to supply the wood or would exist anyway.

Our estimates rely on data from the Food and Agriculture Organization of the United Nations (FAO), which attempts to count roundwood harvests and assumes that the wood comes from live trees. It is possible that the FAO estimate may count some wood harvests that come from already dead wood or that are farm produced as being roundwood harvests. But there are also reasons the use of FAO data may underestimate the carbon effects of fuelwood. Using additional sources of data, including UN energy statistics, Bailis et al. (2015) estimated fuelwood harvests in Africa, Asia, and Latin America to be 37 percent larger than the FAO reported.[j]

Sources: a, b. UNEP 2019; c. Singh et al. 2021; d. Sharma 2017; e. Butz 2013; Sassen et al. 2015; Zidago and Wang 2016; f. McNicol et al. 2018; g. Pearson et al. 2017; h. Bailis et al. 2015; i. Chidumayo 2013; j. Bailis et al. 2015, Supplemental Table 2.

3.7 Summary of Projected Land-Use and Carbon Effects

Although there are many uncertainties in each of these projections, the overall global picture is one of intense global competition for land between 2010 and 2050. WRI's *Creating a Sustainable Food Future* report estimated agricultural land expansion of 600 Mha during that period, stemming from a 56 percent growth in food demand. The average estimate for urban expansion between 2010 and 2050 is roughly 80 Mha. Our forestry scenarios, which consider a projected 54 percent growth in wood demand, imply that if the world does not convert more land to forest plantations, the world must harvest more than 750 Mha of middle-aged secondary forests, or about 700 Mha of secondary forests when plantation productivity increases or fuelwood demand decreases. Land for new forest plantations could theoretically come out of agricultural land, but without concurrently reducing agricultural land demand, converting agricultural land to timber plantations would just lead to additional clearing of forests or savannas elsewhere to replace the forgone food production.

Annual projected carbon costs are also high. From agricultural expansion under BAU, they are expected to be around 6.0 $GtCO_2e$ per year, from urban expansion another 0.7 Gt, and from forestry using our method 3.5–4.2 Gt (and roughly 1.0 Gt less when factoring in substitution benefits for concrete and steel.) Total impacts are 10.0–11.0 $GtCO_2e$ per year.

4. Potential Implications of Policies That Increase Land-Use Demands

The analysis in Section 3 assumes no new policies to increase land use for human products beyond BAU, but some researchers and public officials are encouraging two strategies that increase human land uses in the name of reducing climate change.

One strategy is to expand bioenergy—energy from food crops, energy crops, or forest biomass—with the goal of replacing fossil fuels. The other is to increase the use of wood in construction as a substitute for concrete and steel. In this section, we examine the potential land-use and carbon implications of these potential additional land demands.

4.1 Bioenergy

WRI's *Creating a Sustainable Food Future* report presents a substantial analysis of bioenergy, both of the potential implications for land-use competition and its effect on the climate.

Bioenergy is any method that produces energy from burning biomass, which is any of the fruits of photosynthesis but typically means plants. Partly motivated by the view that bioenergy is carbon neutral, governments have been promoting bioenergy from sources that increase land-use competition in two ways. First, they have promoted the use of crops (e.g., maize, soybeans, and sugarcane) to make liquid fuels for transportation in the form of ethanol and biodiesel. Second, they have promoted the replacement of coal and natural gas in the production of energy or heat with wood, overwhelmingly from additional wood harvests. Researchers also have contemplated vast increases in biomass from the growth of energy crops, such as fast-growing grasses or small trees, as an important future solution to climate change. The potential volumes of biomass, and therefore land-use competition, contemplated are extremely large:

- Many countries have adopted goals to supply 10 percent or more of transportation fuel using liquid biofuels (instead of fossil fuels). If achieved at the global level by 2050, the biofuel would provide only about 2 percent of global energy production but would require a quantity of crops equal to 30 percent of the world's crop production in 2010, measured by their energy content.
- Many modeled pathways to a stable climate assume that biomass is carbon neutral and include between 200 and 250 exajoules of biomass energy (IPCC 2014), which would supply around 20 percent of likely total global energy needs by 2050 (Searchinger et al. 2019). Unfortunately, that goal would require a quantity of biomass roughly equivalent to all the biomass harvested on the planet: all the crops, all the crop residues, all the grasses and leaves eaten by livestock, and all the wood (Haberl et al. 2012). Put another way, to meet this 20 percent energy goal while still feeding people, total biomass harvests would need to roughly double.
- Meeting 5 percent of Europe's final energy demand, a plausible target of present renewable energy standards, would require a doubling of Europe's wood harvests, which equals roughly a 20 percent increase in global commercial wood harvests (Searchinger, Beringer, et al. 2018).
- Producing an additional 2 percent of global energy from wood today, beyond the wood presently burned and while still meeting other demands, would require roughly a doubling of global commercial wood harvests (Searchinger, Beringer, et al. 2018).

Some studies project less land-use competition by assuming that biomass will be supplied by energy crops and that these crops will achieve high yields. Today, biomass yields of energy crops in actual production, such as switchgrass and fast-growing coppice willows, tend to be less than 10 tons of dry matter per hectare per year (Nord-Larsen et al. 2014; Searle and Malins 2014). In some well-watered areas of the tropics, eucalyptus yields can achieve more than 20 tons, and the national average in Brazil appears to be around 16 tons of dry matter.[15] At this high yield of 20 tons of dry matter per hectare per year, and without factoring in what are often large losses during storage, supplying 230 exajoules of bioenergy (20 percent of likely biomass needed to supply total global energy needs by 2050) would still require 575 Mha (an area of well-watered lands that would be equivalent to three-quarters of the continental United States).

Searle and Malins (2014) also provide good reasons for skepticism that such high yields would be achieved on average. As that paper discussed, papers often project that energy crops will have the same rates of yield gains as grain crops in the past while ignoring the fact that the gains in cereal crops were often due to increasing the harvest index—the percentage of plant growth going into the edible seed—rather than total plant growth. If so, actual land demands for bioenergy would be higher.

Whether using food or energy crops or harvesting forests, these bioenergy feedstocks also involve the "dedicated use of land." This means that using them for energy requires diverting some or all of the productive capacity of a piece of land away from food, wood production, or carbon storage and toward energy use. There are some alternative waste sources of biomass, such as municipal waste, but large estimates of future bioenergy use, and most biofuel policies to date, either do not distinguish or still encourage use of some forms of biomass that make dedicated uses of land. And the basic lesson from these analyses is that producing even small quantities of energy from such dedicated uses of land implies large additional competition for land and biomass.

The biophysical reason for bioenergy's high need for land starts with the inherent inefficiencies of photosynthesis. Even under ideal conditions, for the sun hitting a growing leaf with access to all water and other nutrients needed, photosynthesis is likely to convert only a small percentage of the full energy in the sun's radiation into energy in biomass (Batista-Silva et al. 2020). Efficiencies are further reduced by numerous factors: sun that does not hit a leaf, limited water and nutrient availability, a limited portion of the year used to grow crops in most of the world because of cold weather or limited rainfall, and the large quantity of energy that the plant uses to maintain itself. There are then further energy losses in converting raw biomass into usable energy. As a result, even sugarcane ethanol generated in Brazil only converts around 0.2 percent of the energy in the sun's radiation into energy in ethanol (Searchinger et al. 2017).

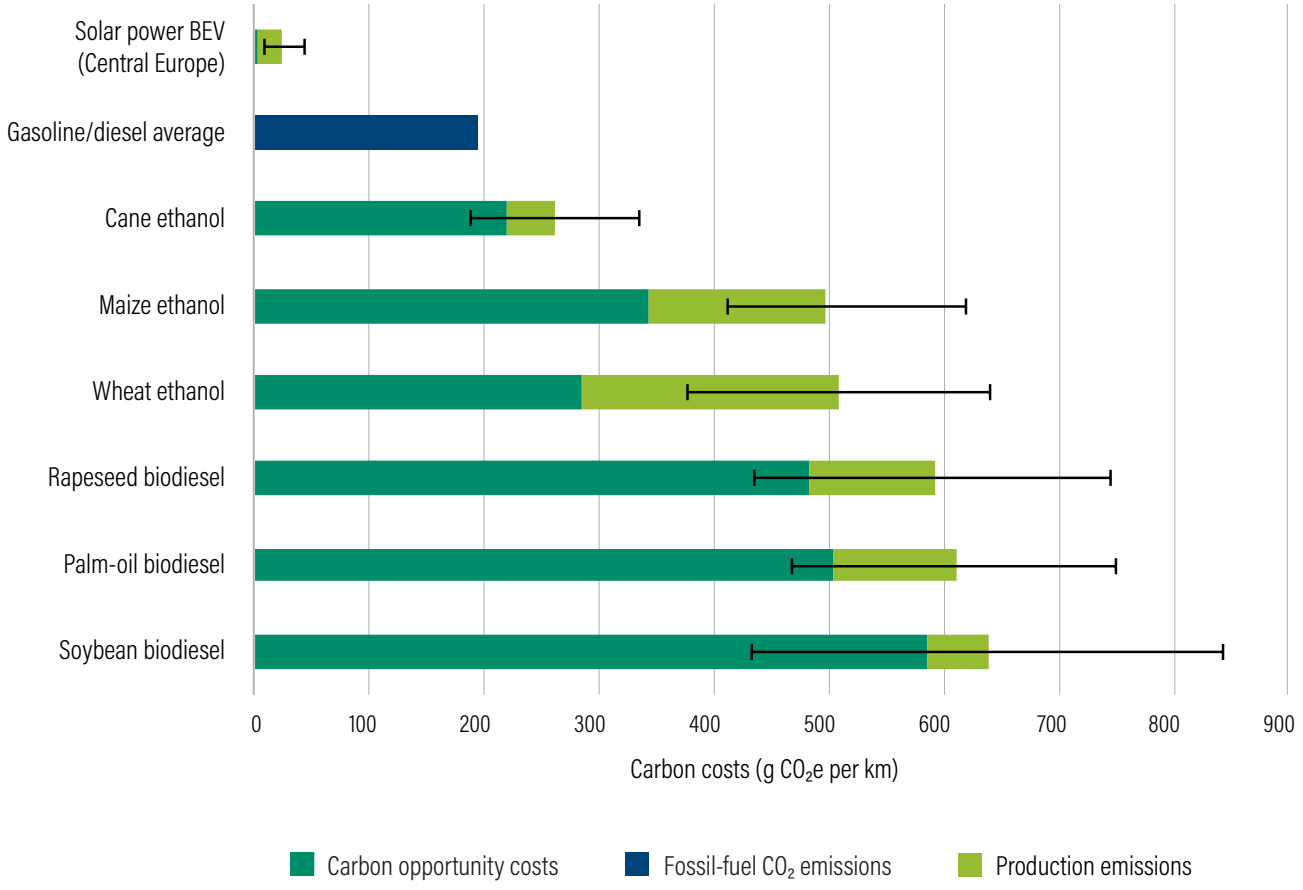
This efficiency can be contrasted with various forms of solar power, such as photovoltaic cells or solar thermal energy. WRI calculated that on roughly three-quarters of the world's land, photovoltaic cells today would produce at least 100 times more usable energy than cellulosic ethanol is likely to do in the future. That advantage rises to more than 250 times when factoring in the added efficiency of electric drivetrains (Searchinger et al. 2017). There are even larger land-use efficiency gains from other forms of solar power, such as solar thermal (Searchinger et al. 2017). Just as importantly, unlike biomass, solar energy does not require use of well-watered, highly productive land but can use desert and rooftops. Biomass can be more easily stored than solar power, but it comes at a heavy land cost.

To determine the GHG consequences of bioenergy, the climate benefits of using land to avoid fossil emissions have to be combined with the climate costs of not using land to meet other needs. For years, and still today, many bioenergy calculations just assume that there is no land-use cost, which leads them to treat the biomass as being carbon neutral. The theory is that the carbon emitted by burning the biomass is offset by the carbon absorbed by growing that biomass. However, this approach fails to recognize that if the land were not used to produce bioenergy, it would still grow plants, which absorb carbon. Those plants could be used directly to store carbon or they could be used for food or timber, which allows other lands to store carbon while the world still meets the same food and timber needs. This carbon cost for using land

for bioenergy is the same carbon cost that applies, and this paper has applied, to food and wood production as well.

Based on our review of the evidence, the best way to calculate liquid biofuels is to factor in the "carbon opportunity cost" of using land to produce crops used for biofuels. This approach, based on a paper published in *Nature* in 2018, measures the average global quantity of land-based carbon lost to produce the crops that are incorporated to produce a certain amount of energy from biofuels (Searchinger, Wirsenius, et al. 2018). Because biofuel crops can be produced for many years on the same land, this method also uses time discounting in the same way we analyze the climate consequences of forestry in this paper, which is roughly equivalent to evaluating the aggregate land-based emissions and fossil fuel savings over 30 years. By this method, per kilometer driven, emissions from using sugarcane ethanol are roughly 40 percent higher than the average emissions from using gasoline and diesel. Emissions from using maize and wheat are roughly two times higher, and emissions from using vegetable oil are roughly three times higher (Figure 16). (Using this method, emissions from palm oil are high but slightly less than those from soybean oil because the higher yields of palm oil roughly compensate for the fact that oil palm trees grow primarily in former carbon-rich, tropical rain forests. This method is also based

Figure 16 | Biofuel emissions greatly exceed emissions from gasoline/diesel or solar-based electric fuel when incorporating the carbon opportunity costs of using land



Notes: BEV = battery electric vehicle. Error bars reflect the range of literature estimates of vegetation and soil carbon stocks used in part to derive the carbon opportunity costs.

Source: Searchinger, Wirsenius, et al. 2018.

on average carbon losses for oil palm and therefore does not fully factor in the increased use of drained peatlands to produce oil palms in the last decade.)

For bioenergy from forest products, the opportunity cost is measured by the carbon that would be stored if the trees were not harvested. A vast number of studies have examined the net climate consequences under different scenarios: different types of forests, different harvest regimes, pelletizing or just chipping the wood, using the wood for electricity or heat, and using the wood to replace coal or natural gas (Appendix D). The consistent finding is that switching from fossil fuels to burning wood will increase carbon in the atmosphere for decades to centuries.

The reasons for this adverse climate impact from wood-based bioenergy result from certain basic biophysical factors (summarized in Searchinger, Beringer, et al. 2018). When wood is harvested, much is left behind (including roots and typically tops and branches), where it decomposes and gives up its carbon to the air. Much wood is lost in the drying process and in debarking, and even more wood is lost when wood is converted to wood pellets. These processes add carbon to the air without replacing fossil fuels. When burned, wood also generates more carbon per kilowatt-hour of energy. This is because its combustion releases more carbon than even coal per unit of energy, and much higher than natural gas, and wood burns at a lower temperature, which reduces the efficiency of converting its energy into electricity. Overall, in the year burned, the committed emissions of wood are at least two times—and often three times—higher than those of fossil fuels for the same amount of electricity or heat, creating what is known as a "carbon debt."

Assuming forests regrow, they can eventually recapture the carbon lost from the harvest and burning of wood for energy use and pay off the carbon debt. For at least a few years, the new regrowing forests would typically grow more slowly than an unharvested forest (because the seedlings are so small). After a few years, they will grow faster, which starts to pay off the carbon debt. But even when the trees harvested in the first year of bioenergy use have regrown enough to pay off their carbon debt, forests harvested in later years for bioenergy have still not regrown sufficiently to pay off their own debts, and it takes many more years for enough carbon debt to be paid off to just match the emissions from fossil fuels. Overall, the precise time period required to pay off the carbon debt varies with the type of forest and harvesting strategy used; whether wood is burned for electricity, heat, or both; and whether wood substitutes for coal or natural gas. Yet as numerous studies of different scenarios have shown, the time is always decades to centuries (See papers referenced in the supplement for Searchinger, Beringer et al. 2018). And even then, it takes many more years of forest regrowth to achieve substantial GHG reductions.

Although over long enough time periods, using wood for bioenergy can therefore reduce emissions relative to fossil fuels, it typically increases emissions for decades to centuries. These uses are therefore inconsistent with public policies seeking immediate reductions in emissions to slow warming.

4.2 Additional Wood in Construction

In addition to bioenergy, there is currently high interest in using additional wood in tall building construction as a mechanism for reducing construction-related GHG emissions, particularly from the use of concrete and steel. The production of both concrete and steel generates high emissions. Each requires abundant energy now supplied by fossil fuels, and the typical production of each releases additional carbon either from the rocks used to make cement or from the carbon used in turning iron into steel. With population and income growth, the world is likely to have a great construction boom in the coming decades, and the potential emissions from concrete and steel in the construction process are a major challenge for climate change (Davis et al. 2018; Steckel et al. 2013). Some policymakers and researchers believe that using more wood in construction would be a low-carbon alternative to concrete and steel. They seek to take advantage of new techniques that

generate thick wood panels of cross-laminated timber that can support taller buildings with far less steel and concrete.

The approach of making broad use of wood in construction is often referred to as "mass timber." In this section, we analyze its potential implications for global wood demand, forests, and land-use competition. In Section 5, we analyze the potential carbon implications, including the potential effects of using wood to replace concrete and steel.

Estimating the potential additional quantity of wood for so-called mass timber has uncertainties and requires estimates or assumptions of the percentage of the population that will become urban, how much additional construction will be built, and how much wood would be required to build each unit on average. We start with projections from a recent study by Churkina et al. (2020), which developed an estimate of the additional timber and wood fiber required per additional urban resident. As described in more detail in Appendix A,[16] we applied these estimates to a projected increased urban population using the SSP2 ("middle of the road scenario"; Dellink et al. 2017). (Some increased use of wood products is already factored into our baseline, and this analysis focuses on the implications of public policies to increase those uses further.)

In supplying this level of wood from industrial roundwood, we followed the assumption in Churkina et al. (2020) that two tons of harvested wood would be required to produce each ton of wood used for construction. When wood is harvested, only some of the wood is usable for construction. Some of the remainder is used for other products, such as paper or wood panels. In our analysis, such uses of wood replace other wood required to meet these needs. But much of the wood is a true waste burned for energy. Here, we are in effect assuming that of the quantity used for construction, an equal quantity will be burned and used to supply some of the energy needed to generate these wood products.

Table 5 shows our results for two scenarios of industrial wood use in which additional wood supplies either 10 percent or 50 percent of new urban construction between 2010 and 2050. Figure 17 shows these "additional timber demand" scenarios on top of the BAU scenario (Figure 12B). Under a BAU scenario without additional wood for new construction, industrial roundwood use rises by 88 percent from 883 million tons of dry matter in 2010 to 1,656 million tons in 2050. Because this increase in the annual use of industrial roundwood phases in over time, the cumulative wood use rises by 15,860 million tons of dry matter (44 percent) compared to a scenario in which global wood supply remains at the 2010 level (see the green triangle in Figure 17). But in this baseline, only 0.5 percent of new urban buildings (mid-rise residential and commercial buildings) are constructed with timber (Churkina et al. 2020).

In a scenario in which an additional 10 percent of urban construction comes from wood, the increase between 2010 and 2050 in the total annual industrial wood use rises by 11 percent more, for a total increase of 55 percent. Cumulative wood use rises another 4,107 million tons of dry matter. If 50 percent of additional urban construction uses wood, the cumulative increase in wood use rises by 20,537 million tons compared to BAU. That 20,537 million tons represents an increase of 57 percent above the BAU industrial wood harvest (44 percent). This leads to a cumulative increase of 101 percent compared to the scenario where the harvest remained otherwise at 2010 levels, or a cumulative increase of 39 percent above BAU levels. Overall, in that "50 percent of construction uses wood" scenario, annual industrial wood use in 2050 would be 201 percent more than in 2010, tripling annual consumption.

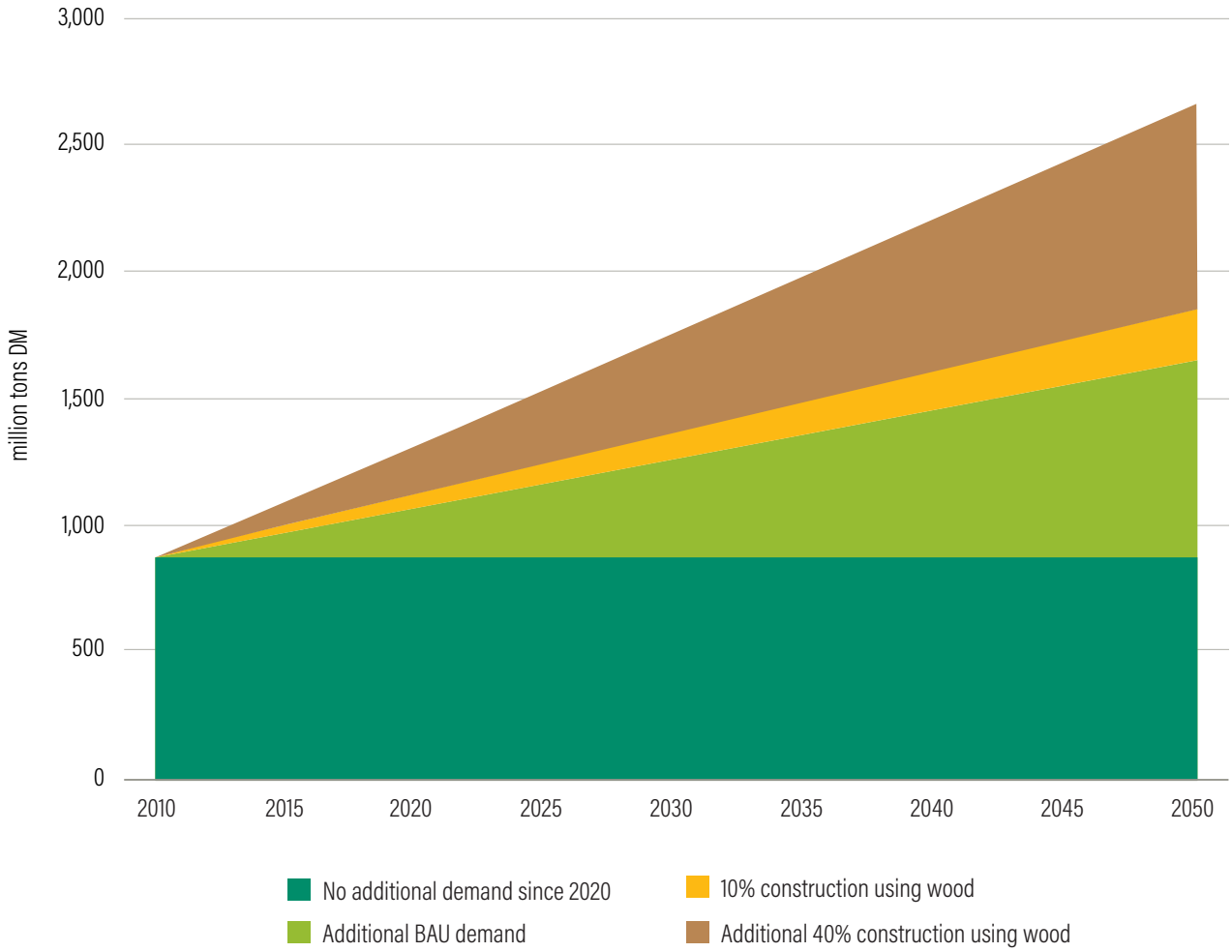
Table 5 | Changes in Annual and Cumulative Wood Demand under Scenarios of Additional Wood Demand for New Urban Construction, 2010–2050

INDUSTRIAL ROUNDWOOD (MILLION TONS DM)	2010 (ANNUAL)	2050 (ANNUAL)	CHANGE BETWEEN 2010 AND 2050 (ANNUAL, %)	TOTAL CUMULATIVE INDUSTRIAL ROUNDWOOD DEMAND (2010–50)	CUMULATIVE INCREASE RELATIVE TO MAINTAINING 2010 SUPPLY (%)	CUMULATIVE INCREASE RELATIVE TO 2050 BAU (%)
Maintain 2010 supply	883	883	–	36,184	–	–
BAU		1,656	88	52,044	–	–
BAU and 10% construction using wood		1,857	110	56,151	55	8
BAU and 50% construction using wood		2,658	201	72,581	101	39

Notes: BAU = business as usual; DM = dry matter.

Source: Authors, adapting additional wood demand scenarios from Churkina et al. 2020.

Figure 17 | Mass timber could greatly increase global timber demand



Notes: BAU = business as usual.

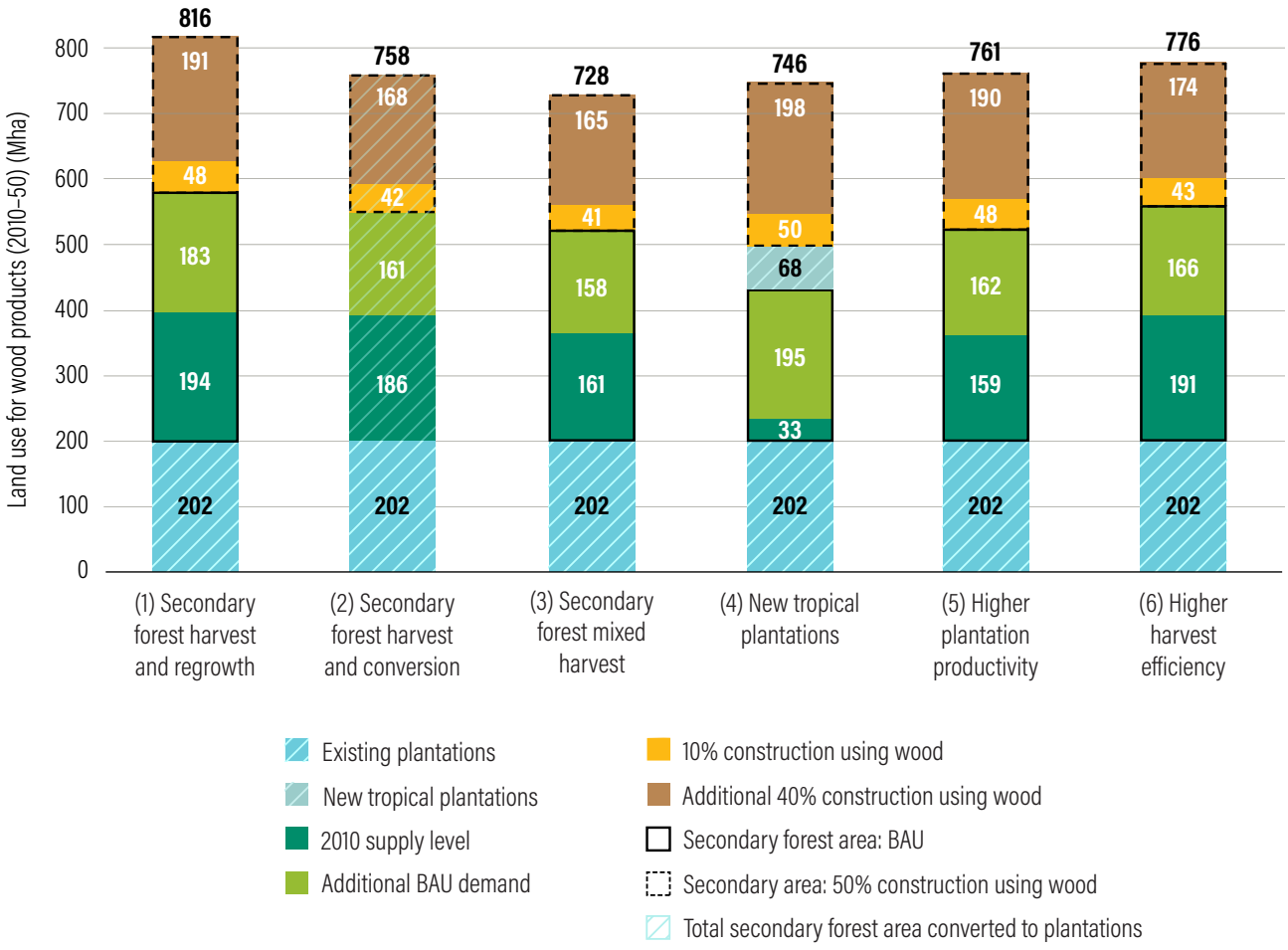
Source: Authors, adapting additional wood demand scenarios from Churkina et al. 2020.

Scaling up our prior global estimates of the BAU wood supply for industrial wood use implies large increases in global area of forest harvested for industrial wood use, as shown in Figure 18. Under the 50 percent construction using wood scenario, there would be around 200-250 Mha of additional secondary forest area required for the first six scenarios (sum of the yellow and brown bars in Figure 18). For the first three scenarios, instead of forest harvest areas (in addition to 2010 plantations) of 320-380 Mha in our BAU scenario (green solid bars), secondary forest harvest areas would range between 525 Mha (Scenario 3) to 615 Mha (Scenario 1).

A larger area harvested would also imply additional releases of carbon to the atmosphere. We did not estimate these carbon implications at this time because they would depend on the type of forest used and many other parameters that are uncertain at this time. We instead discuss below the carbon implications of a variety of different scenarios for supplying this wood.

Other studies have also estimated large additional land requirements under additional demand for wood for construction. One study projected a 170 percent growth in timber demand between 2020 and 2050 (van Romunde 2020) because of urbanization, a shift in preference from steel

Figure 18 | Use of wood to replace 50 percent of concrete and steel in construction would require roughly 200 Mha more wood harvest per year (clear-cut equivalent)



Notes: Projections assume that secondary forests are sources of additional construction wood. Solid bars indicate wood use under business as usual (BAU); hatched bars indicate wood use for construction. Assumes linear phasing in of additional wood demand from 2010 to 2050. Scenarios adapted from Churkina et al. 2020.

Source: Carbon Harvest Model.

and concrete to wood in buildings, and increased construction. It noted that this increased level of timber demand would be 23–57 percent higher than the estimated "sustainable timber supply" during that period (O'Brien and Bringezu 2017). A study by Chatham House found that if newly planted forests were to replace 25 percent of global concrete, the additional forest harvest area would need to expand 1.5 times the size of India (Lehne and Preston 2018). In addition, the preliminary findings from a joint United Nations Economic Commission for Europe and FAO study into future wood supply and demand scenarios showed that additional demand for wood for construction could drive up the prices in forest product markets (up to 47 percent relative to the year 2015) and result in the lowest projected forest sector carbon sequestration potential among various scenarios (Nepal and Prestemon 2019).

Churkina et al. (2020) claimed that such large increases in wood demand would be sustainable because they would not exceed the global growth in forests. Whether or not it is sustainable, this harvest of wood is not carbon neutral for the reasons we have explained elsewhere in this report.

5. GHG Consequences of Using Wood for Construction

Modern efforts to increase the use of wood in construction, known as mass timber, rely on new wood construction techniques for wood to support taller buildings. They involve ways of gluing together multiple layers of smaller boards under high pressure, typically in alternating directions, to create thick panels known as cross-laminated timber (CLT) or beams known as glued-laminated timber. (We hereafter refer to both as CLT.)

The core purpose, as reflected in the Churkina et al. (2020) analysis, journalism, and many nongovernmental organization or industry papers, is to reduce GHG emissions by replacing concrete and steel with wood products in construction (EESI 2018; Robbins 2020; Roberts 2020). But there are also competing papers that find increased use of wood for construction will actually increase emissions (see Appendix B), a view articulated by more than 200 scientists in a letter to the U.S. Congress in 2020 (Moomaw et al. 2020). We ask the following question: Under what conditions, if any, does the use of wood in construction yield a net-benefit effect on the climate?

To analyze the GHG consequences of using wood for construction, we first examined the formal literature to identify the key differences between analyses. Most differences depend on whether the harvest of wood is viewed as carbon neutral, meaning that carbon emitted by the burning or decomposition of wood is not counted as an emission. The accounting question of whether "sustainably" harvested wood should be viewed as carbon neutral is the same as that presented by different analyses of the consequences of using wood for bioenergy (although the details of the proper carbon calculations will differ between construction wood and bioenergy). As discussed above, a complete analysis should factor in all carbon pools, including forest carbon pools; we then use CHARM to explore the GHG consequences of wood use in construction under different possible scenarios and with different assumptions.

5.1 Lessons from the Literature

To understand the different estimates of the GHG consequences of using wood for construction, we performed a careful review of more than 60 papers addressing this topic. We group these into several categories, as set forth in a comprehensive table in Appendix B, and we explain them and our assessment of their accounting approaches in this section.

5.1.1 Papers finding benefits for construction that treat harvesting wood as carbon neutral

Of the papers reviewed, 59 find net climate benefits from wood construction using analysis that treats wood as carbon neutral. This assumption means that although they do factor in emissions from fossil fuel used in the production of wood, they do not factor in the carbon lost to the air due to decomposing or burned wood. That loss of carbon is counted neither at the point where it occurs nor as the loss of carbon storage in the forest, either of which can be a legitimate way of factoring in these carbon losses. Papers treating wood as carbon neutral in this way fall into one or more of the following categories:

- **Wood is carbon neutral if forestry is sustainable or if forest carbon stocks are maintained overall.** Of these papers treating wood as carbon neutral, nearly all do so based on the assumption that wood is inherently carbon neutral so long as forests are managed sustainably. Often the term *sustainable* is left undefined, but for some papers *sustainable forest management* means that carbon losses from forest harvests in a given year are at most equal to gains in carbon elsewhere within a defined "forest management area" (e.g., see Lippke et al. 2011). According to certain papers, this forest management area can include a whole state or even a whole country (Ganguly et al. 2020).
    - Of these papers, all factor in a substitution benefit for replacing concrete and steel. This is based on calculations that the fossil fuel requirements to produce the wood for constructing a building are less than those for making the steel and concrete the wood replaces.
    - Within this group, 46 papers go even further: they not only count these substitution benefits and ignore the loss of carbon in the forest, but they also count the wood incorporated into buildings or other LLPs as a carbon storage gain. In effect, just transferring the same wood and the same carbon from the forest to a building is considered to be a carbon gain—even though that carbon transfer does not remove more carbon dioxide from the atmosphere. To illustrate the implications of such an approach using an extreme example, a forest harvest could take 100 tC out of the forest, incorporate just 1 ton of carbon into buildings, add 99 tC to the air by burning the wood or allowing it to decompose, and this approach would count the overall

process as an increase of 1 ton of carbon storage and therefore a removal of 1 ton of carbon from the air.

- As we discuss above, sustainable forest management does not make wood carbon neutral, even if that means just harvesting the "incremental growth" of wood so that the overall carbon stock in a country's forests (or a smaller forest management unit) is not reduced. If that growth were not harvested, more carbon would be stored in the forest; thus, the net effect of the harvest is to reduce that forest carbon. If forest management increases the growth of wood, that increased growth must be factored into the analysis (and scenarios that include such growth are included in our CHARM modeling). But the mere fact that forests are growing in some broader area, country, region, or the world does not make harvests carbon neutral.
- To justify the carbon neutrality approach, a few of the reviewed papers offer a brief economic argument although without actual economic analysis. This argument is usually a variation of the contention that forests grow to meet the demand for wood rather than simply existing on their own, so increasing wood demand will result in more forests. (Although none of these papers provides an economic analysis, a couple use economic analysis to address other questions, such as the possible effects on the prices of different harvests [Xu et al. 2018].)

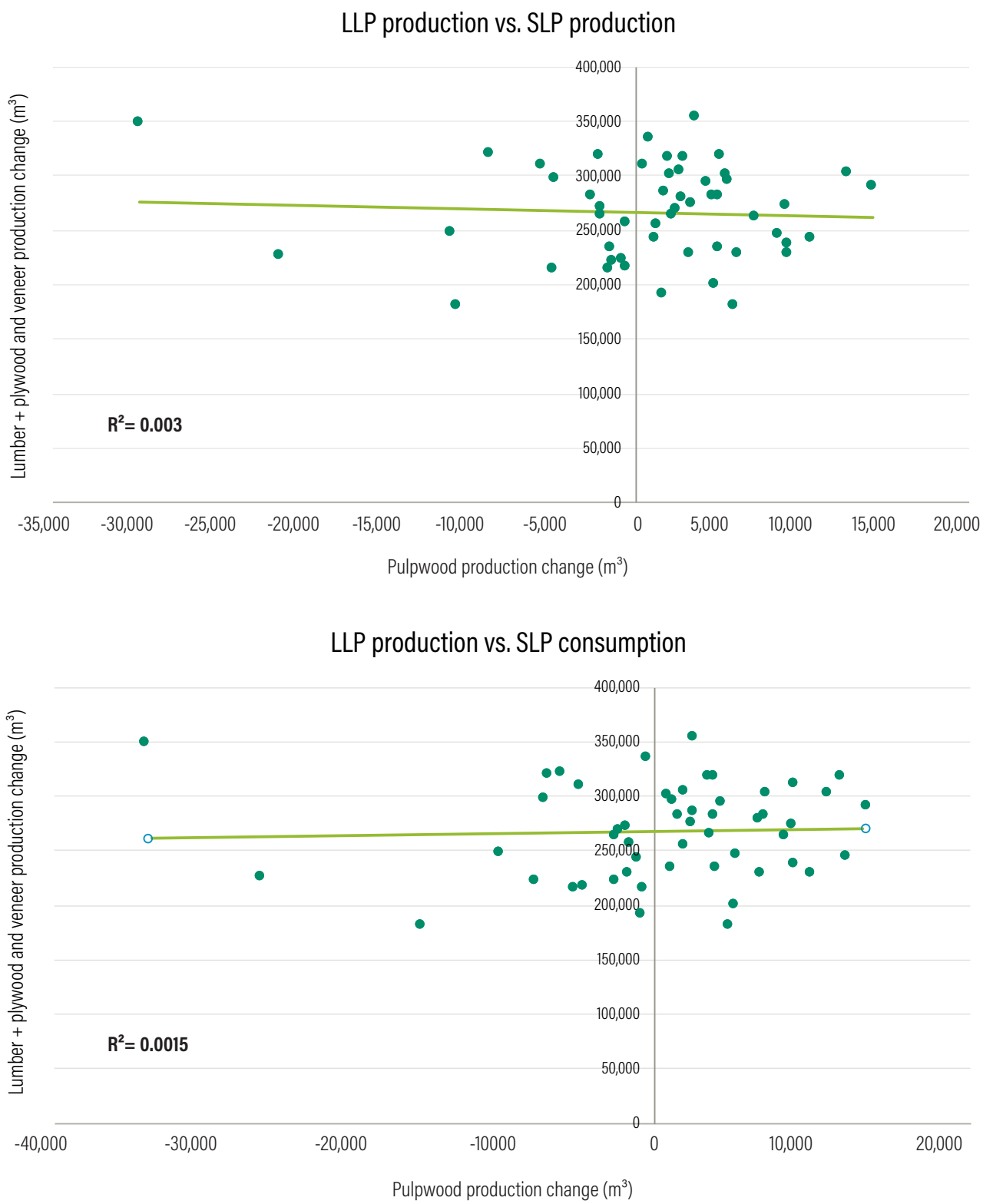
As we discuss in Box 6, the vast majority of forests exist because the areas they occupy are not economically usable for agriculture either because of biophysical conditions that make the benefit-cost ratio of their agricultural use poor or because of a lack of local infrastructure. Whether changes in forest product demand results in a global increase in areas planted for forests at the margin, or triggers more intensive management (with a variety of consequences), is a challenging econometric question, whose implications for policy we address in Box 6.

- **Wood for construction is carbon neutral so long as wood is diverted from pulp and paper products.** A few papers do not assume that forest biomass is carbon neutral in general, or even just because forests are "sustainably" managed, but examine scenarios in which they assume that the additional wood used for construction would otherwise be used for pulp and paper. As a result, increasing wood for construction causes no additional wood harvesting. For example, Smyth et al. (2020) and Xu et al. (2018) analyzed such scenarios, and, not surprisingly, they result in climate benefits. In this scenario, wood that would otherwise decompose quickly after being used as paper is instead stored longer in buildings, effectively delaying the emissions associated with the wood products. Showing the importance of this assumption, Smyth et al. (2020) also included an analysis that involved additional harvests in the northern lake states of the United States, and in that scenario, there was an increase in GHG emissions.

  For the use of wood in construction to divert wood from pulp and paper, it is not enough for pulp and paper product use to decline over time (which may or may not occur for other reasons); instead, the additional use of wood for construction must actually cause a decline in pulp and paper. None of the papers reviewed offers any evidence of such a causal relationship. To do this kind of analysis rigorously requires challenging economics, but it is possible to gain insights just by examining whether there is any correlation between LLP consumption or production and production and consumption of pulp and paper. Using data from the United States (Howard and Liang 2019), which is the world's largest producer of pulp and paper, we found no correlation as shown in Figure 19 (R^2 of .003 and .0015).[17]

  In addition, even if there were a relationship, this type of analysis would not show that increasing demand for timber would be better than using other tools to reduce demand for paper. To the contrary, if leaving wood unharvested is better than harvesting that wood for timber, it logically follows that the better carbon result is to reduce demand for paper and use that reduction to harvest less wood.

Figure 19 | There has been no correlation between production of LLPs and paper production or consumption in the United States



Notes: LLP = long-lived product; SLP = short-lived product. Each point represents a separate year.

Source: Howard and Liang 2019.

- **Harvesting wood is not only carbon neutral but is also credited with all forest wood growth.** Some papers not only assume that harvested wood is carbon neutral but they also give wood products a credit for all the carbon in forests used to supply the wood. Implicitly, these papers assume that, without the demand for wood for construction, the land in effect would be barren. Under these assumptions, use of wood for construction results in no costs but three benefits: more wood stored in products (buildings), substitution benefits for concrete and steel, and more carbon stored in wood on forestland. One such paper (Lippke et al. 2004) is an official publication of the Consortium for Research on Renewable Industrial Materials. In this paper, the wood growth was responsible for more than 80 percent of the claimed climate benefit of constructing a wood-framed house (with the remainder coming from less fossil energy use).

  In effect, this approach assumes that forests that supply wood for construction exist because of the construction wood demand. The implicit assumption—or logical conclusion—of such analytical approaches is that all forests in the world exist because of wood demand. We consider this approach untenable both because vast areas of forests that are harvested cannot possibly exist only because of those harvests and because large areas of forest exist that are not harvested at all. In addition, devoting any land to providing human products, including wood, has carbon costs relative to devoting land just to storing carbon or to meeting other human needs (Box 6).

  Wood demand does lead to economic effects. At the margin, these economic effects may alter forest areas or management and may lead to rebound effects on agricultural land and even uses of steel and concrete elsewhere, and those consequences can affect carbon balances. Nevertheless, merely incorporating economics into the analysis does not justify treating wood as carbon neutral, let alone claiming that harvesting wood is what causes all forests to store carbon in the first place. Instead, such an analysis must examine and not merely assume the economic effects, and it must incorporate those economic effects on carbon storage into the analysis.

  Economic analysis must also occur in a balanced way. For example, if a paper examines whether increased use of wood for construction would reduce uses of wood for other purposes, it should also examine whether reduced steel and concrete for construction would increase their uses in other ways as well. Both would be caused by the price effects of changing wood or steel consumption. As we explain in Box 6, any such analysis should only contribute to policy recommendations after first analyzing, through biophysical models, what physical changes in land use and management are most desirable.

  Potential biodiversity effects provide an additional reason to separate biophysical from economic analyses. For example, if additional demand for wood were to result in increased forest plantings, a likely source would be plantations or other highly managed forests established on agricultural lands with very low productivity. In Europe, an estimated 10–20 percent of agricultural land consists of diverse grassland and woodland complexes with extremely low grazing use that are categorized as “high nature value” farmland (Paracchini et al. 2008; Strohbach et al. 2015). The conversion of such lands to forest plantations is broadly recognized as a major threat to European biodiversity (Strohbach et al. 2015). This example highlights that no land is “free” from either a carbon or biodiversity perspective. A first analysis (such as in this report) therefore should be to determine which land-use alterations are environmentally desirable from a biophysical standpoint; only after doing so should it examine how different policies, including their economic feedbacks, can help achieve those results.

BOX 6 | Economic Feedbacks and Relevance for Treating Wood as "Carbon Neutral"

Some papers, such as Lippke et al. (2004), implicitly assume that forests only exist to supply wood and, as a result, all carbon stored in forests or in construction material represents additional carbon storage caused by the use of wood. We consider this argument untenable.

Vast areas of forests predated any wood harvest. Few people would argue, for example, that the Amazon or Congo rain forests, or vast boreal forests, exist because of the demand for wood. There is also a rich literature that finds forest regrowth occurring in countries for a range of reasons separate from forest demand. These reasons include the declining need for agricultural land; the declining agricultural competitiveness of some lands; and the reduced harvesting of forests for bioenergy, which occurred as countries shifted to fossil fuels.[a] In general, the vast bulk of forests exists in places where agriculture is too marginal to be competitive, whether because of cold, intermittent rainfall, poor soils, or lack of sufficient human infrastructure. Most of these forests are still regularly or at least occasionally logged, including nearly all forests in Europe and the United States. For this large quantity of forests, there can be no serious claim that forests exist because of the demand for wood.

In addition, if people only allowed forests to exist to supply wood, there would be no reason for forests to grow in excess of the growth in forest product demand. People would only grow forests enough to meet expected demand. But forests are growing both globally and regionally, which creates what is known as the "forest carbon sink."[b] In addition to forest area expansion in many developed countries as agricultural land declined, large increases in forest growth are caused by climate change itself.[c] These facts do not mean that wood product demand cannot encourage some more forest area at the margin, but they do mean that forest product demand cannot explain the overall pattern of net forest growth even after accounting for rising harvests.

A legitimate economic question is whether increasing the demand for wood can induce additional forest plantings and expansion of forest area to offset some or all of the carbon losses from harvesting wood. Economic effects might also lead to more intensive management of existing forest areas, for example, by planting monocultures of fast-growing trees such as loblolly pine or eucalyptus or by thinning forests more. These can be thought of as economic feedback effects. We do examine biophysically the possible carbon consequences of supplying more wood from plantations in this report, but we do not examine these economic feedback effects in part because those effects address a secondary question. They address the question of how to achieve certain global land-use or management changes and what role is played by increased demand. This report addresses the question of what actual changes in land use are advisable from a global environmental perspective in the first place.

Put another way, the model used in this report, like other biophysical models, assumes aggregate levels of demand and specific yields for food or wood on different lands. It is possible that changes in consumption by one person affect the consumption by others and the types of supply through changes in prices. The model we use evaluates the effects of aggregate demand and supply regardless of what forces shape them. What this type of model can therefore answer is what the carbon and land-use consequences are of changes in these aggregate levels.

The economic effects of increasing or decreasing demand for oil provides a useful analogy. Technology road maps for climate change mitigation commonly seek to identify possible future paths for reducing overall energy consumption and replacing oil with various low-carbon alternatives. Yet if any one individual or country reduces oil consumption, the price of oil will decline. Absent any other policy measures, lower prices will lead to increased oil consumption by others, which reduces some of the climate benefits.[d] That is an important effect to understand in crafting policies to achieve desired energy transitions. But it is not necessary to estimate what the efficient and desirable energy transitions should be.

If policies induce increased demand for construction timber, there will be effects on prices, which could lead to a range of changes with advantages and disadvantages for climate change. Beneficial changes might include increased forest plantings. More intensive management might also lead to faster wood growth, generating more usable wood on the same land. But negative effects are also likely. Increased plantings in one location on agricultural land would tend to result in expansion

BOX 6 | Economic Feedbacks and Relevance for Treating Wood as "Carbon Neutral" (cont.)

of agricultural land elsewhere to replace the forgone food production. If the yields in the new land are lower than in the land planted as forest, the effect could be a loss of forest globally. More intensively managed forests, although producing faster growth, also commonly store less carbon because they are harvested at a younger age. Although using more wood in construction might reduce the use of concrete and steel for construction in some buildings, that reduction would also marginally reduce the prices of concrete and steel and likely result in some offsetting uses of concrete and steel by others.

Estimating any, let alone all, of these effects is enormously challenging. The limited availability of different demand and supply elasticities that are estimated using rigorous econometrics raises doubts about whether such estimates can be meaningful. Gaps include almost no data on cross-price elasticities (how changes in demand or supply of one product influence demand or supply of another). Other major gaps include few if any long-term elasticities. Both such types of effects must be known with reasonable confidence to make such estimates meaningful.

Fortunately, as in the oil consumption analogy, these effects are not necessary to estimate the extent of future land competition or potential and desirable paths for resolving these conflicts. The world has a fixed quantity of land. To the extent that wood demand leads to more forest plantings, they do not create more land beyond the world's fixed land base but rather take land away from some other use, typically agriculture. More land dedicated to wood production means less land available to produce food. More intensive management can lead to less carbon storage on site but spare more natural forests and other habitats.

Biophysical models, such as GlobAgri-WRR and the Carbon Harvest Model, can be used to estimate what combination of production or consumption changes for food and wood would be most desirable from a carbon and biodiversity perspective. They can answer such questions as what consumption or production changes are needed to free up more land for plantation or natural forests. They can also answer questions such as whether it would be better to restore forests and leave them alone or to plant forests and harvest them for wood products if more agricultural land were available for forests.

In short, biophysical accounting models are a way of assessing what combinations of production systems and consumption patterns would be necessary to minimize land-use change emissions and maximize land-based carbon storage while still meeting all human demands for land-based products. To do that analysis, uses of land to supply one source of demand, such as wood, cannot expand without consequences for meeting demand supplied by another use, such as food. And if one land-use pattern is conditioned on reduced consumption, such as reduced food consumption, this type of analysis can identify if such a change is feasible or even desirable. The land-use requirements for each demand must be assessed, and then the scenarios must be analyzed that can assess the consequences and methods of meeting overall use land demands (and not merely shift one use of land to another).

Using biophysical models to determine what are the most desirable outcomes does not mean that economic effects are unimportant or that economic analysis has no role to play. Economic analysis, if rigorously done, can help people understand how economic effects amplify or buffer policy effects. Economic analysis can also help guide the most effective use of economic incentives. The first step, however, should be to determine what biophysical changes are most desirable—and that is the focus of this report.

Sources: a. Birdsey et al. 2006; Krausmann et al. 2015; Meyfroidt and Lambin 2011; b. Friedlingstein et al. 2019; Harris et al. 2021; Pan et al. 2011; c. Ciais, Schelhaas, et al. 2008; d. Gillingham et al. 2016.

5.1.2 Papers applying an all-carbon-pools accounting approach

A substantial but smaller group of papers analyzes the consequences of additional wood harvests using some variation of the "all-carbon-pools" modeling approach used by CHARM to calculate the carbon effects of global wood harvests. This approach uses a biophysical model to compare the benefits of harvesting wood over time to the benefits of leaving wood unharvested.

In this approach, the scenario may start with a middle-aged forest, which initially stores carbon in live vegetation, dead standing trees, and detritus (wood decomposing on the forest floor). If unharvested, these pools of carbon keep growing as the forest ages, although the growth rate will decline over time. For the harvested scenario, the live wood is immediately diminished, but some of the wood is left in the forest in a pool of dead tops, branches, and roots, which then declines over several years. Of the wood removed from the forest, some is used for timber products, creating different timber product carbon pools. These pools can include wood used in construction, which lasts longer, and wood used in furniture, which does not last as long. Another pool includes wood used for paper products, which are quickly used and then recycled or thrown away. And much of the wood is burned as a by-product in the process of making timber and paper products. As wood products are thrown away, they build and then decay in landfills. Each of these pools has its own decay rate, and the loss of carbon from all these pools adds carbon to the air. Forests are also allowed to regrow, so the pool of live carbon in the forest increases in the years after harvest. Models of this type track the change in all these pools of carbon over time.

These models can also track the effects on another carbon pool, which is the pool of carbon stored underground in fossil fuels. Fossil energy used in the process of harvesting and making wood products reduces that pool (i.e., increases carbon in the air), but the use of wood products can save fossil and related emissions used to produce steel, concrete, or other products; in that way, it

increases the quantity of carbon that remains stored underground. Waste wood burned in the process of making timber and paper products can also save fossil fuels, although it is usually less than the fossil fuels used to make wood products. The net fossil fuel consequences of using wood rather than alternatives are usually expressed as a "substitution value" for replacing standard construction materials such as concrete and steel with wood.

Applying this approach generates a net GHG emissions result in each future year, and this approach is typically then used to estimate a net effect on the climate at a specific time. Because this approach accounts for the reduction of carbon in the forest due to wood harvesting, the results are less favorable to the use of wood than treating the wood as carbon neutral (assuming the same substitution values). The papers applying this approach can still differ from each other based on the assumptions used for key parameters.

One general finding of these papers, when applied to specific stands of forest, is that when the harvests and uses of wood occur as they have typically occurred in the past—with wood going to its average mix of uses—the harvest of additional forest stands to supply construction increases carbon in the atmosphere for at least decades. That was one of the conclusions of the original Schlamadinger and Marland (1996) model, discussed above, which originated this all-carbon-pools approach. Analyzing U.S. forests, it found that "it takes over 100 years for the conventional forestry scenario . . . to achieve the same net C benefit as the forest protection scenario." The paper also found that a scenario with "highly efficient conventional forestry," such as plantation forestry, resulted in increased emissions initially and required 40 years to match the consequence of leaving a forest unharvested. This result means that forest harvests lead to more carbon in the air for 40 years; at 40 years, the carbon is the same, but by 100 years, there would be significant GHG reductions relative to leaving the forest unharvested.

Following a similar all-carbon-pools approach, Keith et al. (2014) found that wood harvests in Australia, using two major forest types as examples, would increase emissions even after 100 years compared to leaving the trees unharvested. Ingerson (2009) analyzed wood harvests in the United States and generally found large increases in carbon emissions for decades.

Studies of wood harvests have come to the same conclusion when analyzing a whole region's or country's forest harvests as they have occurred or do occur. For example, Hudiburg et al. (2019) used an all-carbon-pools approach to analyze the net effect of forest harvests after 1900 in the western United States (California, Oregon, and Washington) based on the best available data from actual wood uses. That paper found that forestry had resulted in large net increases in carbon in the atmosphere, even more than 100 years after the start of harvests analyzed. Essentially the same research team, using data based on forestry practices in Oregon, also projected that forest harvests would increase emissions relative to reduced forest harvest through at least 2100 (Law et al. 2018).

Xu et al. (2018) produced similar results studying options for changing Canadian forest management, finding that harvesting less had better climate results, even though one result of harvesting less would be less wood in LLPs.[18] Kalliokoski et al. (2020) applied the same approach in Finland for carbon and found that harvesting wood in typical ways (15 percent for process energy and the rest divided between LLPs and SLPs) resulted in higher emissions than leaving the same wood unharvested for many years.[19] Skytt et al. (2021) found the same for Swedish forests, finding increased emissions from harvesting versus not harvesting for at least 50 years in each of four different forest areas. Even two alternative papers analyzing Swedish forest harvests still found increases in atmospheric carbon from increased rather than decreased harvesting for at least several decades; however, one paper found the potential for immediate benefits if, contrary to present practice, very high levels of residues and tree stumps were removed and used for bioenergy (Gustavsson et al. 2017, 2021).

These estimates of the multiple uses of wood as they typically occur do not by themselves prove that harvesting of more wood just for construction generates adverse effects. A few papers apply this accounting framework and find net terrestrial carbon gains compared to nonharvesting under three conditions. First, forests are efficiently harvested, meaning little wood is left behind.

Second, the great majority of the additional wood harvested is used to replace concrete and steel. Third, doing so has a large substitution benefit in the form of reduced overall fossil and other production emissions in construction. For example, Oliver et al. (2014) found that if some forests were very efficiently harvested and used primarily to provide structural beams that replaced steel in construction, the net climate effects were immediately positive.

Chen et al. (2018) illustrates the importance of key parameters in estimating the years to "parity" for wood use and harvests from Canadian forests. (Until parity is reached, wood harvests increase emissions.) Like the results in the western U.S. studies, Chen et al. (2018) found that if wood is harvested and used with the average mix of construction, pulp and paper, and other uses, these harvests increase carbon in the atmosphere for 84 years.[20] However, when Chen et al. (2018) analyzed alternative scenarios, they showed quick benefits in some scenarios and under some assumptions. For example, they found immediate benefits if 73 percent of harvested wood were used for structural construction panels (i.e., CLT) and if they assumed large substitution benefits in replacing concrete and steel in construction (i.e., lower uses of fossil fuels). Yet the parity period still varied greatly depending on the substitution value. Using what the paper described as a "low" substitution value (0.68 tC saved per ton of carbon in wood), even structural panels required 75 years to reach parity with alternatives. Using what it called a "midrange" substitution value (2.43 tC/tC in wood), structural panels generated immediate carbon savings, and using "high-end" substitution values (4.20 tC/tC in wood), all LLPs generated immediate climate benefits.

One general finding . . . is that when the harvests and uses of wood occur as they have typically occurred in the past . . . the harvest of additional forest stands to supply construction increases carbon in the atmosphere for at least decades.

The analysis by Chen et al. (2018) shows that the assumed biophysical parameters matter (and many such parameters have important subparameters). That study highlighted two categories of parameters: those that determine the percentage of wood harvested that is incorporated into products used in construction to replace steel and concrete and those that determine the quantity of production emissions saved by each ton of wood used in this way (i.e., the substitution value). These parameters have a multiplicative effect because the more wood used for construction, the more emissions can be saved by reducing production of concrete and steel.

Yet the best-case scenario in Chen et al. (2018) is far from present practice and may not be achievable. As the paper itself notes, its percentage of wood incorporated into any LLP is far more than double the use for wood in construction that is currently typical in Canada. A 2020 publication by the U.S. Forest Business Network, based on consultation with the major CLT suppliers, estimated that, on average, only 50 percent of raw wood originally dedicated to CLT ends up in the product (Anderson et al. 2020, 12, Table 1.2). The percentage of the total wood removed from the forest turned into CLT is likely lower because some of the logs will not be of a quality to be brought to a CLT plant. Moreover, the substitution value required by Chen et al. for quick GHG reductions from the best product (structural panels) is more than four times higher than the estimate in Smyth et al. (2017), another Canadian researcher with the same institute.[21] We include this scenario because it was included in this other paper, but we doubt that it can be commonly achieved.

5.3 Percentage Change in Emissions Compared to Concrete and Steel

Another reason substitution parameters matter is that they are important for estimating a critical question that is almost ignored in the literature. Even in cases where using wood reduces emissions, what is the percentage reduction in overall GHG emissions from the use of wood in construction to replace concrete and steel?

This is a standard question for most GHG analyses but is surprisingly left uncalculated, or at least not presented, by nearly all papers addressing the climate benefits of mass timber. The standard method in these papers is to report the kilograms of GHG emissions reductions per kilogram of wood, but that is a different issue. If the goal of substituting concrete and steel in construction with wood is to reduce GHG emissions, then a key question is what percentage of the GHG emissions from construction are reduced when wood is substituted. Put another way, for every square meter of building constructed, what percentage change in emissions occurs? If that percentage reduction could be high under common and likely harvest and use scenarios (e.g., close to 100 percent), then substituting wood in construction could be a valuable practice, justifying large effort and incentives. But if that percentage reduction is low even in optimistic scenarios, then other strategies would be necessary to meet climate targets and less effort would be justified in developing mass timber as a climate solution.

The percentage reduction fits into policies in other ways as well:

- If the percentage reduction is large only under limited scenarios—particularly if it increases emissions under others—then the potential benefit may not justify the risk that wood use will result in adverse scenarios.
- If the percentage reduction is medium (e.g., 50 percent), then it could entirely disappear if emissions from concrete and steel could be reduced by 50 percent. In addition, if the mass timber development strategy relies on use of badly managed land, that suggests the badly managed land could be improved to provide climate benefits in other ways. An example might be producing more wood for existing uses, allowing other forests to remain unharvested. The combination of reducing emissions from concrete and steel plus using forestland in other ways (e.g., to store even more carbon) could therefore produce two sources of GHG mitigation versus the single source of using the land to reduce construction emissions.
- If the percentage reduction today is low, any justifiable incentive payment would be low, and benefits might not justify adverse effects on biodiversity.

One interesting question is what the percentage reduction in emissions from using wood instead of concrete and steel would be even assuming the carbon neutrality of wood. Few studies provide sufficient information because the final substitution value per ton of carbon in wood is not enough.[22] Using data provided in Churkina et al. (2020), which has a substitution value of 0.45 tC/tC in wood used for construction, the net reductions estimated from uses of construction material were 36 percent for residential housing and 65 percent for commercial housing.[23] These seem like meaningful reductions, but in the range of what might be achievable with new techniques for concrete and steel as well. Extrapolating some of the numbers in Churkina et al. (2020) to the higher substitution value of 1.2 in Leskinen et al. (2018)—and still keeping the authors' carbon neutrality assumption—the percentage reduction from using wood becomes 83 percent, which gets close to the elimination of emissions.

These calculations, however, treat wood as carbon neutral, meaning they do not factor in the loss and emission to the air of any carbon in wood itself, so they are incomplete. What these calculations do suggest, though, is that the substitution value is an important parameter in determining the percentage reduction, and it is also likely to vary by building technique and wood material.

Percentage reductions are also likely to decline over time because techniques are also available to reduce emissions from concrete and steel and will be a priority regardless of the use of wood in construction because of other uses of these materials. Possible techniques for reducing

emissions from steel or concrete include capturing the carbon emitted from their production and putting it underground, a variety of alternative manufacturing techniques using various forms of renewable energy in their production, new chemical forms of concrete, new smelting processes for steel, and adjusting building designs to require less concrete and steel (Lehne and Preston 2018).

Because the percentage change is a critical policy question, the nearly universal failure of literature to calculate and discuss it is a major limitation in the analysis of mass timber. A proper analysis needs to calculate the percentage reduction in emissions by using wood for construction but also to do so using an all-carbon-pools approach to the effects of wood harvest.

We therefore built into CHARM an analysis of percentage changes using an all-carbon-pools approach. Factoring in this approach means that the change in emissions from harvesting wood, including its effect on construction emissions, factors in not only the change in production emissions (e.g., the fossil fuel emissions used to produce construction material) but also the change in carbon stored in some pool (such as forest vegetation and wood products).

5.4 Analyses of Carbon Implications of Harvesting Wood for Construction Using CHARM

To further explore the GHG consequences of harvesting additional wood in which some goes for construction and some goes to other uses, we applied CHARM to a range of possible forests and harvest scenarios. As described above, the model follows the all-carbon-pools approach originally developed by Schlamadinger and Marland (1996) and used in many other papers.

We also show the results using two approaches to time: one is just the net effect on GHGs in the atmosphere 40 years after each harvest. The other is a time-discounting approach using a 4 percent discount rate. In the results discussed in this section, we apply this discount rate to carbon flows over 40 years. (In Appendix E we discuss the effect of applying the 4 percent discount rate to carbon flows over 100 years, which has little effect except in a few scenarios. We do not make 100 years our central scenario because it is difficult to predict future conditions accurately, such as future substitution values.)

We apply CHARM to several different forest types: typical western U.S. forests, southeastern U.S. hardwood forests, southeastern U.S. intensive loblolly pine, and various scenarios in forests in Germany, Brazil, and Indonesia. For each of these scenarios, we show a variety of options and assumptions. We mainly show results with substitution values, using 1.2 tC avoided per ton of carbon in wood used, the midrange value in Leskinen et al. (2018). We also show results with different percentages of harvested wood used for construction material to replace concrete and steel. The graphic for each scenario identifies the parameters used and shows how different carbon pools change over time. Our goal is both to explore some likely results and to explore the importance of key parameters listed in Table 6, which represent real biophysical differences.

The general counterfactual to harvesting is to let a natural forest continue to grow. This assumption does not require that the specific stand of forest used for wood for construction would otherwise remain unharvested. In many situations, a particular stand of wood would be harvested and used for another purpose if not used for construction (just as a particular liter of gasoline if not used by one person would almost certainly be used by another). But more wood use requires more harvesting overall. As when evaluating gasoline, our assumption is that a similar stand somewhere, which would otherwise continue to grow, is harvested because of the increased overall demand for wood.

For plantation forests, our assumption is a little different. The assumption that any plantation forest would be left to grow unharvested generally makes little sense because they were planted specifically to be harvested. For plantation forests, we therefore use the counterfactual assumption that a natural forest would have otherwise been allowed to start growing at the time the plantation forest was established. As a result, the higher growth rates that derive from plantations are fully "credited" to the wood products. For harvests of secondary forests, we also assume 40-year-old forests.

Table 6 | Main biophysical and wood usage parameters for CHARM wood harvest analysis

	U.S. PACIFIC NORTHWEST HEMLOCK-SITKA SPRUCE	U.S. PACIFIC NORTHWEST DOUGLAS FIR	U.S. SOUTHEAST OAK-HICKORY	U.S. SOUTHEAST LOBLOLLY-SHORTLEAF PINE	BRAZIL	INDONESIA	GERMANY
Time period (year)	41	41	41	41	41	41	41
Rotation length (year)	50	50	25	25	7	7	60
First harvest age of secondary forest (year)	74	89	60	58	40	40	74
Young plantation growth rate (tC/ha/year)	2.8	2.7	3.6	3.6	8.2	7.2	1.7
Old plantation growth rate (tC/ha/year)	3.6	3.3	2.2	2.2	8.2	7.2	1.7
Young secondary forest growth rate (tC/ha/year)	2.7	2.3	2.0	2.1	3.7	4.3	1.7
Middle-aged secondary forest growth rate (tC/ha/year)	2.2	2.2	0.8	0.5	1.1	1.2	1.3
Plantation slash share (%)	13	13	9	9	13	29	25
Secondary forest slash share (%)	23	23	23	23	55	71	23
Existing wood usage							
LLP share (%)	33	33	33	33	31	60	54
SLP share (%)	29	29	29	29	31	2	8
VSLP share (%)	38	38	38	38	38	38	38
% of LLP used for construction	45	45	45	45	42	42	30
% of LLP that displaces concrete and steel	64	64	64	64	64	64	64

	40% CLT	70% CLT
LLP share (%)	50	70
SLP share (%)	25	15
VSLP share (%)	25	15
% of LLP used for construction	100	100
% of LLP that displaces concrete and steel	80	100

Notes: adj = adjusted; GDP = gross domestic product; proj = projection; RSE = residual standard error.

Source: Carbon Harvest Model.

Table 7 presents results for all the example scenarios, which we discuss below using figures that illustrate the changes in carbon pools over time. In these figures, the dotted green line shows the carbon stored without wood harvesting and the solid black line shows the total carbon stored as a result of wood harvests (including additional fossil carbon that remains underground). If the point on the black line in any year is below the dotted green line, it means the harvest increases carbon in the air, and if above the dotted green line, it means GHG savings. The position of these lines after 40 years shows the net effect at that time. Other lines show the different components of carbon storage caused by wood harvests, which sum to the solid black line. Each chart also shows the present discount value (PDV) of the wood harvest, and the percentage change in the GHG emissions by switching from concrete and steel to wood for construction.

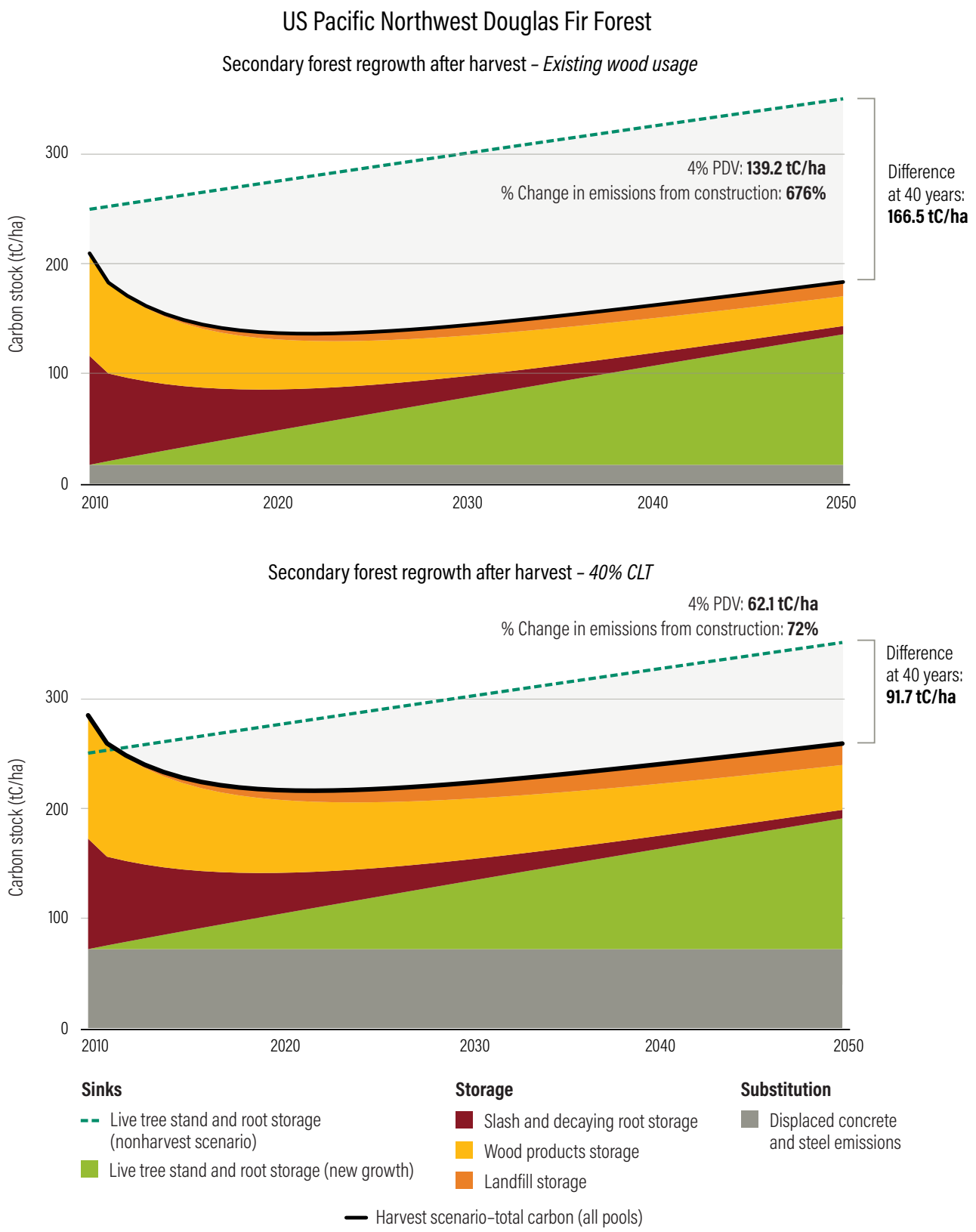
5.4.1 U.S. Pacific Northwest

Our first two examples involve harvests of two major forest types in the western (wetter) portions of the U.S. Pacific Northwest, including Hemlock-Sitka spruce forests and Douglas fir on highly productive sites. When directing wood according to existing patterns of wood use, any harvest is highly negative (Figure 20).

We did alternative scenarios under assumptions that 40 percent of the wood would be turned into construction timber that replaces steel and concrete, the "40 percent CLT scenario." As shown in Table 7, under these scenarios, the additional harvest of wood would also be adverse for the climate in all variations.

If, however, 70 percent of wood could be used to replace concrete and steel, which we call the "70 percent CLT scenario," there could be GHG savings. For Hemlock-Sitka spruce forests (Table 7), the savings would be 18 percent if the forest is allowed to regrow naturally and 26 percent if converted to a plantation. For Douglas fir, the GHG reductions for such variations would be 11 percent and 20 percent, respectively. We consider these reductions to be informative because we doubt that such a percentage of wood could replace concrete and steel. However, because even doing so would fail to achieve a 50 percent GHG reduction, the result suggests limited potential for this kind of strategy for these types of forests.

Figure 20 | Carbon Cost of Harvesting the U.S. Pacific Northwest Douglas Fir



Note: PDV = present discount value. Positive carbon numbers mean increases in emissions while negative numbers mean decline in emissions.

Source: Carbon Harvest Model.

5.4.2 Southeastern United States

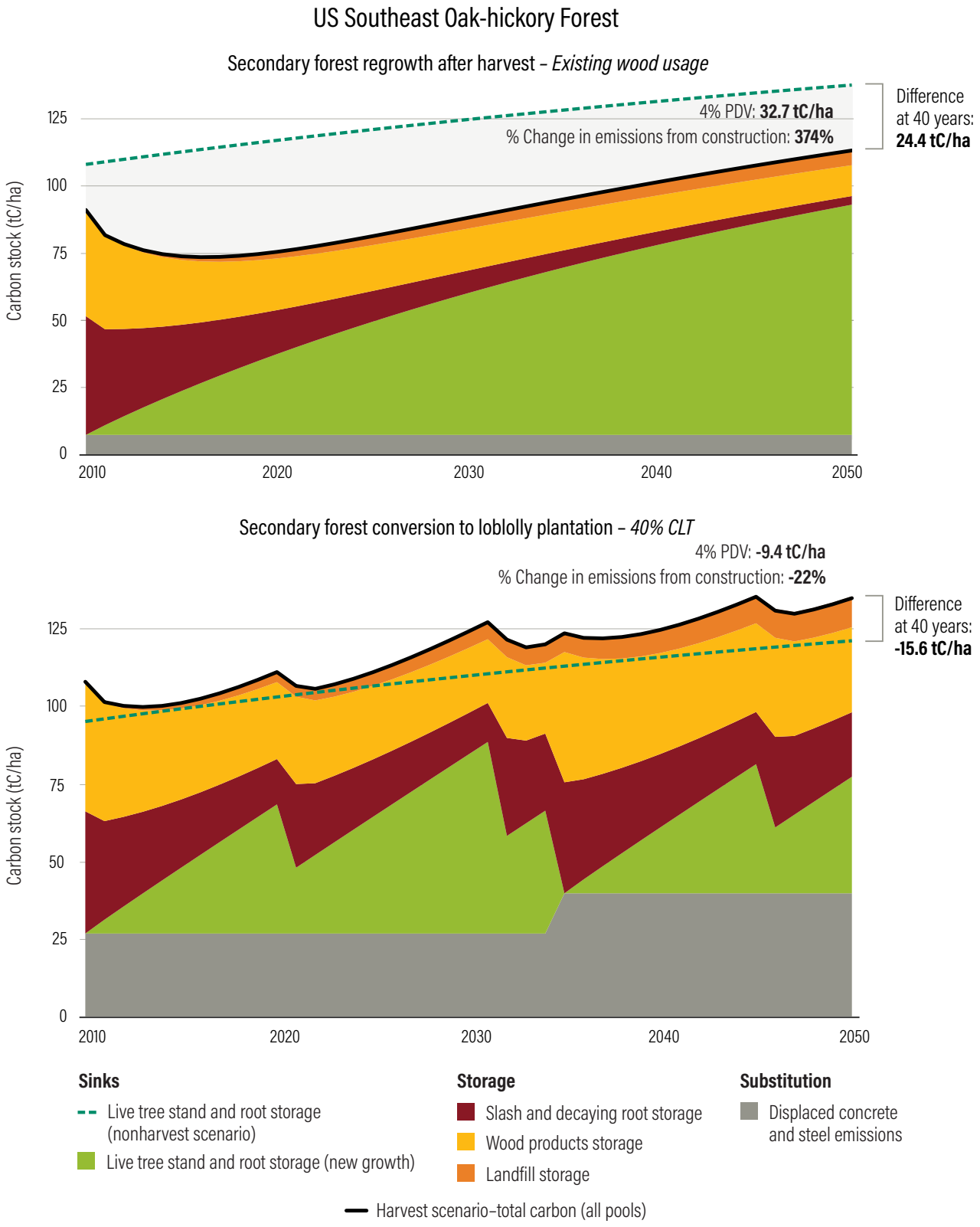
We also looked at scenarios that focused on the southeastern United States, which has become the major "wood basket" of the United States and where the vast majority of wood comes from privately owned forests. We first looked at scenarios for harvesting hardwood forests, in particular an oak-hickory forest. In our current wood-uses scenario, although a third of the wood is used for solid wood products, only 10 percent ultimately replaces concrete or steel in construction. The net effect is multifold increases in GHG emissions if wood replaces concrete and steel in construction, and that is true even if secondary forests are converted to plantations (Figure 21).

In our 40 percent CLT scenario, there is no benefit to harvesting wood in this type of forest and allowing a secondary forest to regrow and a small reduction (22 percent) if converting that forest to a loblolly pine plantation. As in our Pacific Northwest forest examples, however, there would be gain even with secondary forest regrowth of 52 percent if 70 percent of the wood could be devoted to CLT.

We also evaluated the use of intensively managed loblolly pine plantations in the southeastern United States. There is a large disparity in growth rates between average planted loblolly stands and those that are highly managed, but here we used the average growth rates between the artifical regenerated loblolly without disturbance (from U.S. Forest Service inventory data for WRI) and the regional high productivity loblolly stands (Hoover et al. 2021). We analyzed an existing loblolly plantation using the assumption that if that plantation had not been planted, a secondary forest would have been allowed to grow instead. (This rationale reflected the fact that any plantation is intended to be harvested, but the opportunity cost was allowing a secondary forest to grow.) In this scenario, emissions increase roughly threefold.

In our 40 percent CLT scenario (Figure 22), however, the emissions reductions are roughly 29 percent for harvesting an existing plantation. In our 70 percent CLT scenario (Table 7), the emissions reductions rise to roughly 70 percent.

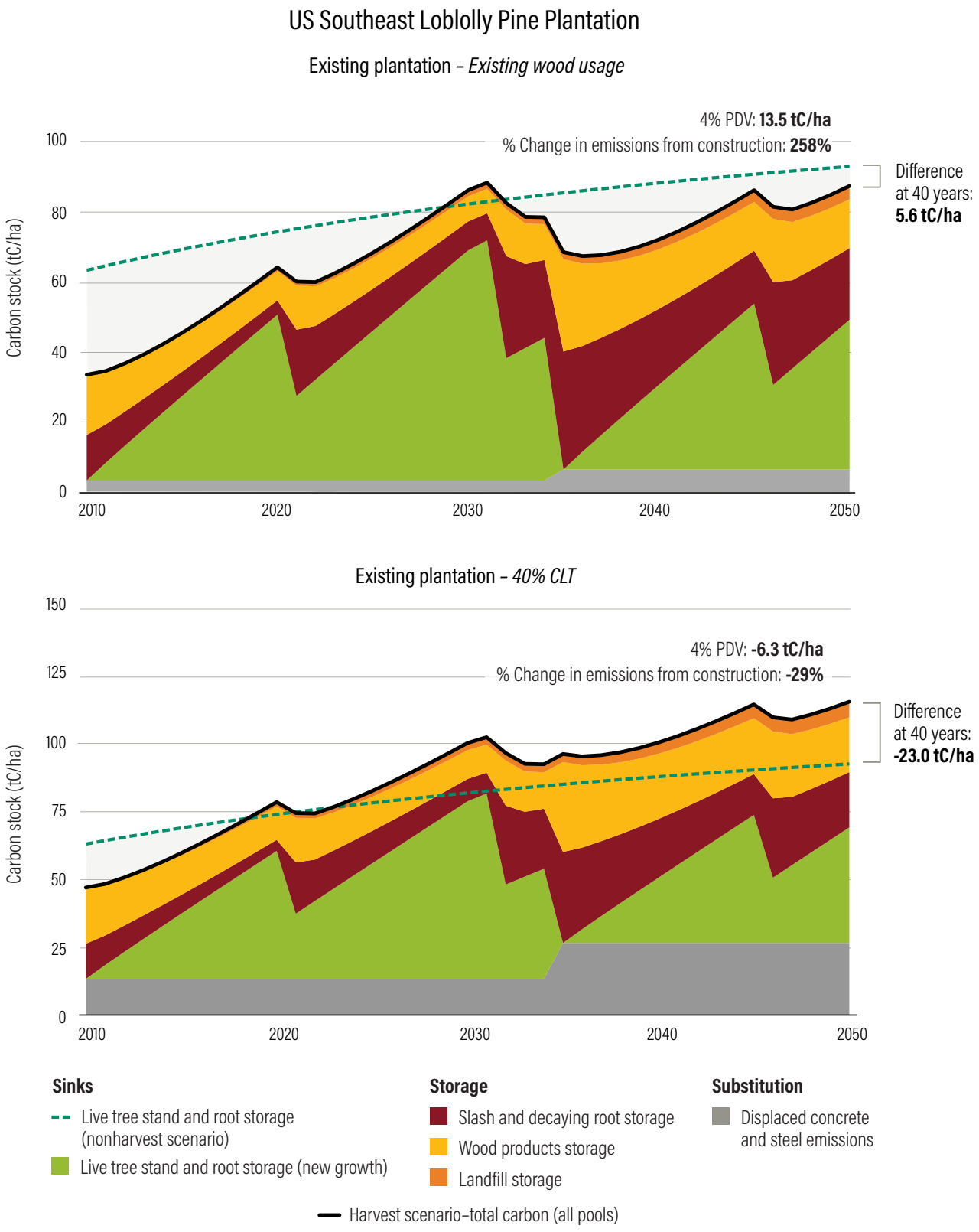
Figure 21 | Carbon Cost of Harvesting the U.S. Southeast Oak-hickory



Note: PDV = present discount value. Positive carbon numbers mean increases in emissions while negative numbers mean decline in emissions.

Source: Carbon Harvest Model.

Figure 22 | Carbon Cost of Harvesting the U.S. Southeast Loblolly Pine



Note: PDV = present discount value. Positive carbon numbers mean increases in emissions while negative numbers mean decline in emissions.

Source: Carbon Harvest Model.

5.4.3 Germany

Our analysis of forests in Germany provides similar results to our analysis of secondary forests in the United States (Figure 23). For these analyses, we are using both secondary forest and plantation forest growth rates from Harris et al. (2021). Both growth rates are relatively modest. In these scenarios, given these growth rates, harvesting secondary forests and allowing them to regrow, harvesting secondary forests and converting them to plantations, and harvesting established plantations all result in large (several hundred percent) increases in emissions for construction material.

Even in our 70 percent CLT displacement scenarios, harvesting wood for CLT produces small emissions reductions. In all variations of this highly optimistic scenario (involving secondary forests and regrowth, conversion to plantations, and harvest of existing plantations), the net GHG effect is within 25 percent range as using concrete and steel. These limited results for plantations are partly due to the data finding that plantations in Germany generally do not grow significantly faster than more natural forests. That may be due to the fact that even forests considered more natural are heavily managed in Germany.

5.4.4 Brazil

We analyzed scenarios for forests in Brazil using both natural forests and plantations (Figure 24). At this time, CLT does not use hardwoods, which means it would not use normal tropical forests. In addition, CLT cannot presently use eucalyptus, which is the primary plantation type in Brazil. Nevertheless, we analyze Brazilian scenarios for several reasons. First, even if CLT is not used, sawn wood could also be used for additional construction in general. Our analysis is applicable to sawn wood although the results are likely to be less favorable since it is likely to be less effective in replacing concrete and steel. Second, it is possible that manufacturing CLT may determine a way to use both eucalyptus and hardwoods (Liao et al. 2017). Third, tropical forests of one kind or another could become the indirect sources of wood if temperate forests are used more for construction, and our analysis implicitly addresses such a scenario.

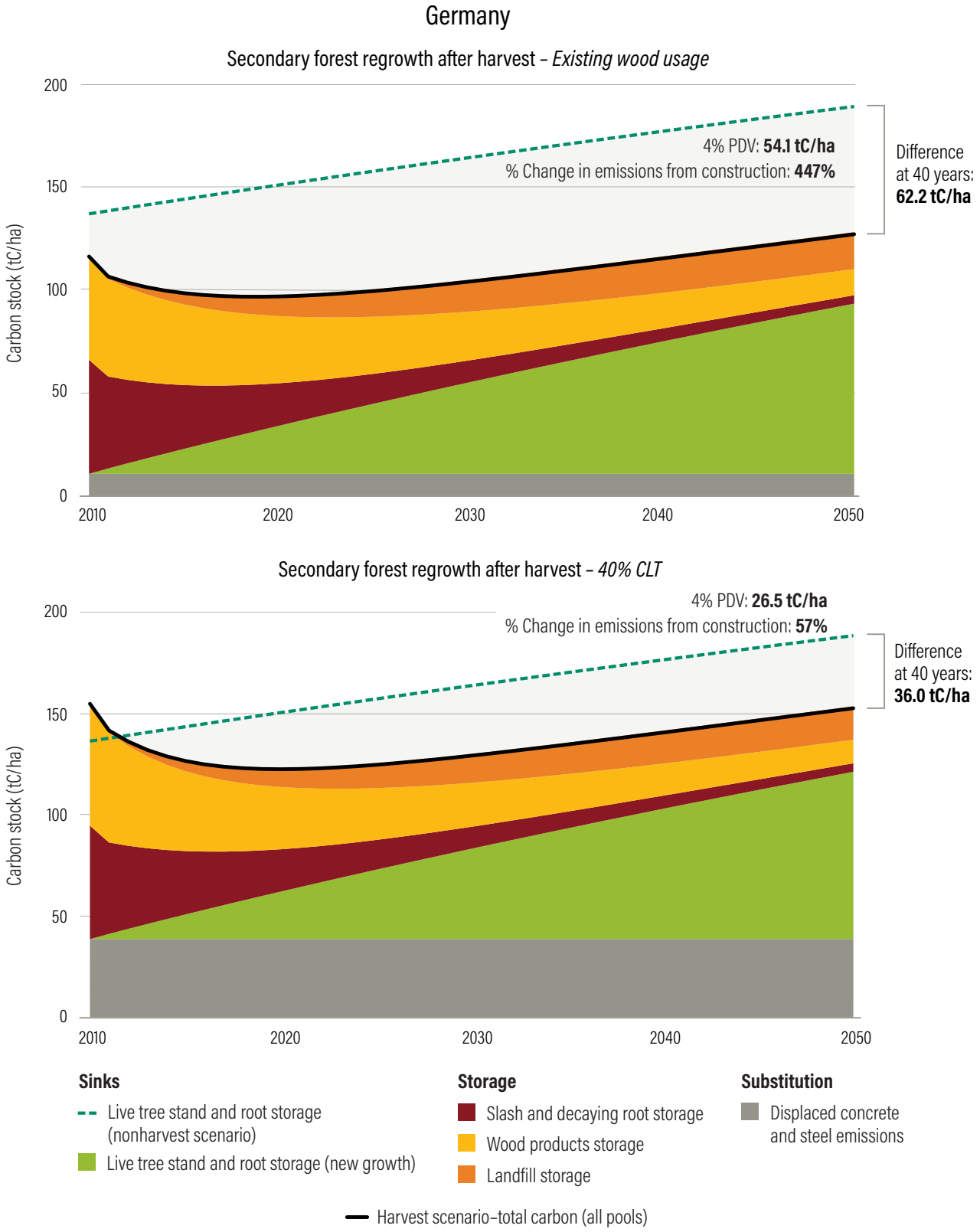
Our first group of scenarios allocates wood based on Brazil's present overall uses of wood in which only 10 percent of wood harvested both gets into construction and is used to replace concrete and steel. In these scenarios, all harvests of secondary forests have adverse carbon impacts compared to leaving forests alone, even if converting secondary forests to plantations. Even harvesting plantations has adverse consequences.

In our 40 percent CLT scenario, however, there is a 75 percent reduction in emissions from construction material when converting existing forests to plantations (Figure 24B) and an 113 percent reduction when using existing plantations (Table 7). In the 70 percent theoretical CLT scenario, these reductions rise to 95 percent and 117 percent, respectively. In this 70 percent CLT scenario, even harvesting secondary forests would reduce emissions from construction materials by 33 percent.

5.4.5 Indonesia

The Indonesia examples (Table 7) have some similarities to Brazil but also some distinctions, which are probably due to our higher estimates of secondary forest growth rates and our higher estimates of wood used for construction under existing conditions. Harvesting secondary forests and regrowth is disadvantageous, and even in the 70 percent CLT scenario, it generates no savings. Using existing plantations is beneficial in all wood-use scenarios, but only reaches 68 percent reduction in emissions compared to concrete and steel in the 40 percent CLT scenario. Only in the 70 percent CLT scenario do even existing plantations reach very high levels, in this case 91 percent. Perhaps most significantly, in the conversion scenario, the harvest is adverse with existing usage patterns, reaches only a very small level (24 percent) at the 40 percent CLT level, and only reaches 65 percent in the 70 percent CLT scenario (Table 7).

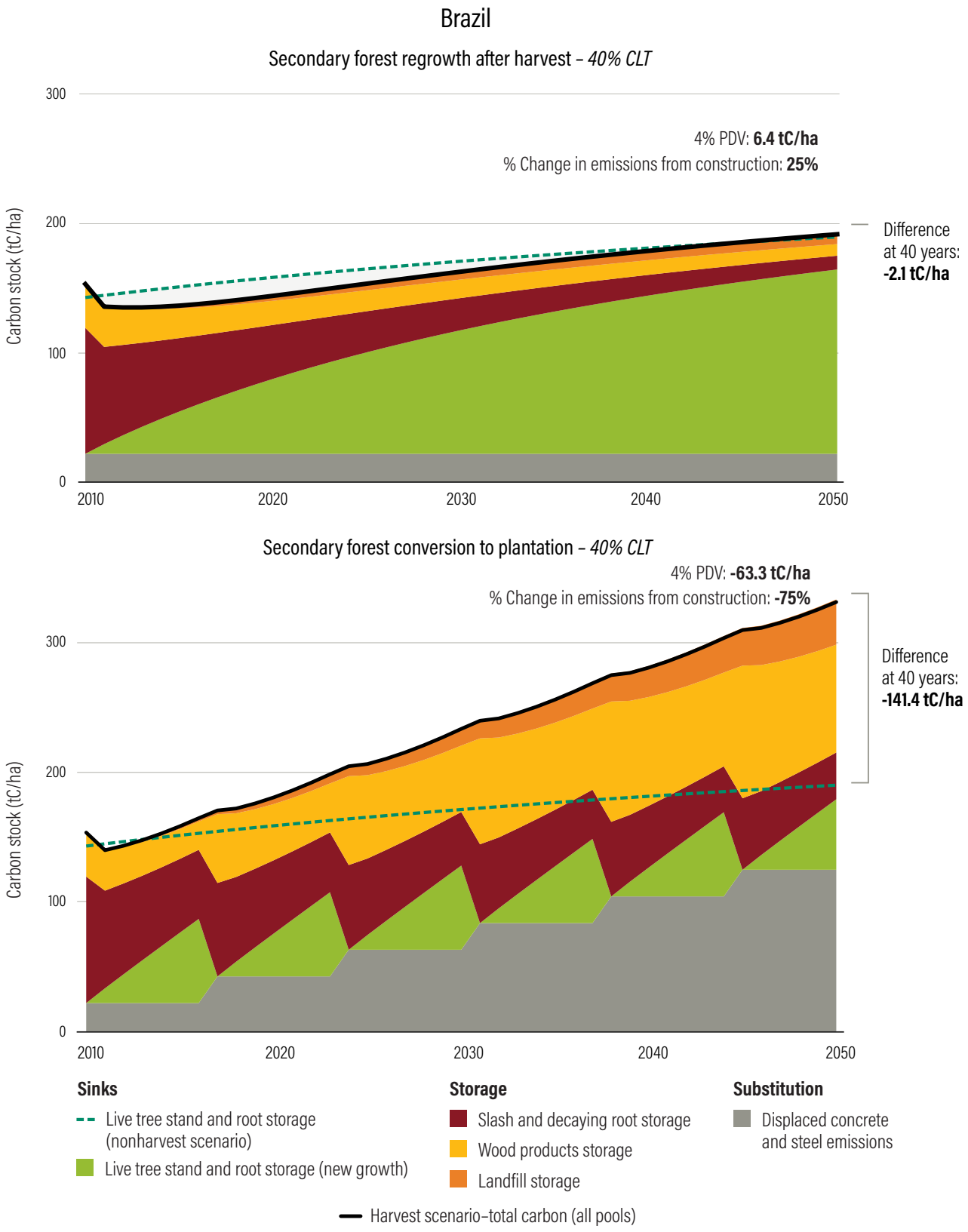
Figure 23 | Carbon Cost of Harvesting Forests in Germany



Note: PDV = present discount value. Positive carbon numbers mean increases in emissions while negative numbers mean decline in emissions.

Source: Carbon Harvest Model.

Figure 24 | Carbon Cost of Harvesting Forests in Brazil



Note: PDV = present discount value. Positive carbon numbers mean increases in emissions while negative numbers mean decline in emissions.

Source: Carbon Harvest Model.

Table 7 | Climate effects of harvesting wood for construction under different scenarios

SCENARIO	EXISTING WOOD USAGE			40% CLT			70% CLT			EXISTING WOOD USAGE			40% CLT			70% CLT		
SUBSTITUTION FACTOR	0.44 tC/tC									1.2 tC/tC								
DISCOUNT RATE	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions	CCarbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions
	4%	No discount		4%	No discount		4%	No discount		4%	No discount		4%	No discount		4%	No discount	
U.S. Pacific Northwest Hemlock-Sitka spruce																		
Secondary forest and regrowth	125.4	140.7	+1,419	86.8	104.2	+235	46.5	65.1	+73	115.6	131.0	+622	46.1	63.5	+59	-24.3	-5.7	-18
Secondary forest and conversion to plantation	114.7	109.4	+1,299	76.2	72.9	+207	35.9	33.8	+56	105.0	99.7	+565	35.5	32.2	+46	-34.9	-37.0	-26
Existing plantation	78.9	66.0	+1,121	47.9	36.5	+162	15.2	4.7	+29	71.1	58.2	+480	15.2	3.8	+24	-42.0	-52.5	-39
U.S. Pacific Northwest Douglas Fir																		
Secondary forest and regrowth	150.0	177.3	+1,532	107.3	136.9	+263	62.6	93.6	+88	139.2	166.5	+676	62.1	91.7	+72	-15.9	15.1	-11
Secondary forest and conversion to plantation	135.7	142.1	+1,386	93.0	101.7	+228	48.3	58.4	+68	124.9	131.3	+606	47.8	56.6	+56	-30.2	-20.1	-20
Existing plantation	72.3	65.7	+1,101	43.4	38.2	+157	12.9	8.5	+27	65.0	58.4	+471	12.9	7.7	+22	-40.5	-44.9	-40
U.S. Southeast Oak-hickory																		
Secondary forest and regrowth	37.3	29.0	+898	19.2	11.8	+111	0.2	-6.5	+1	32.7	24.4	+374	0.0	-7.3	0	-33.0	-39.8	-52
Secondary forest and conversion to plantation	34.8	39.1	+709	13.3	12.8	+65	-9.3	-15.5	-26	29.4	32.3	+285	-9.4	-15.6	-22	-48.7	-65.0	-65
U.S. Southeast Loblolly-shortleaf pine																		
Existing plantation	16.2	9.6	+653	5.2	-6.2	+50	-6.4	-23.3	-35	13.5	5.6	+258	-6.3	-23.0	-29	-26.6	-52.6	-69
Brazil																		
Secondary forest and regrowth	34.0	23.9	+1,203	20.1	11.6	+162	8.2	0.7	+40	30.8	20.8	+519	6.4	-2.1	+25	-14.3	-21.8	-33
Secondary forest and conversion to plantation	26.1	15.4	+303	-19.0	–62.9	-47	-61.6	-139.6	-89	16.6	-1.2	+92	-63.3	-141.4	-75	-137.7	-275.6	-95
Existing plantation	-6.4	-9.6	-77	-50.5	–87.6	–128	-93.9	-165.5	-136	-15.5	-25.8	-89	-94.1	-165.4	-113	-107.2	-301.7	-117

Table 7 | Climate effects of harvesting wood for construction under different scenarios (cont.)

SCENARIO	EXISTING WOOD USAGE			40% CLT			70% CLT			EXISTING WOOD USAGE			40% CLT			70% CLT		
SUBSTITUTION FACTOR	0.44 tC/tC									1.2 tC/tC								
DISCOUNT RATE	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions	Carbon impact (tC/ha)		% change emissions
	4%	No discount		4%	No discount		4%	No discount		4%	No discount		4%	No discount		4%	No discount	
Indonesia																		
Secondary forest and regrowth	25.3	16.2	+609	24.5	16.7	+269	16.1	9.2	+110	-20.7	-11.6	+237	14.4	6.6	+75	0.0	-6.9	0
Secondary forest and conversion to plantation	22.1	3.1	+182	17.6	-1.0	+61	-12.7	-55.6	-26	-8.7	20.2	+34	-14.3	-57.4	-24	-67.1	-152.8	-65
Existing plantation	-3.8	-18.7	-33	-9.0	-24.2	-32	-40.0	-79.9	-81	16.3	41.1	-68	-40.1	-79.8	–68	–94.6	–177.2	–91
Germany																		
Secondary forest and regrowth	60.5	68.6	+1,050	50.8	60.3	+231	27.6	39.0	+72	54.1	62.2	+447	26.5	36.0	+57	-14.7	-3.3	-18
Secondary forest and conversion to plantation	57.9	60.7	+1,005	48.2	52.5	+219	25.1	31.2	+65	51.6	54.4	+425	23.9	28.2	+51	-17.3	-11.1	-21
Existing plantation	61.0	58.1	+1,696	54.9	52.8	+395	40.1	39.2	+165	57.1	54.2	+754	39.6	37.5	+135	13.3	12.4	+26

Notes: Positive numbers show increases in emissions while negative numbers show reductions. Pink cells show results that are adverse for the climate while green cells show results that are beneficial for the climate.

Source: Carbon Harvest Model.

5.5 Sensitivity of Results to Different CLT Percentages and Substitution Factors

We analyzed additional scenarios to explore the significance of different substitution factors for concrete and steel. Analyses shown above use a substitution factor of 1.2 tC avoided per ton of carbon in wood based on a global meta-analysis of substitution coefficients (Leskinen et al. 2018). We then reanalyzed the results using an alternative substitution factor of 0.44 derived from data in Churkina et al. (2020), which is similar to estimates by Smyth et al. (2017).

The results are complex, but the basic lessons are as follows. In scenarios with existing wood uses, in which little wood goes to CLT, the substitution factor has only a small effect. In 40 percent and 70 percent CLT scenarios, however, the different substitution effects can be meaningful. For example, when converting a secondary forest to a loblolly pine plantation in the 40 percent CLT scenario, the different substitution effects change an 65 percent increase of emissions into a small reduction at 22 percent. And in the 70 percent CLT scenario, a reduction of 26 percent rises to 65 percent. This effect makes sense because the substitution value is of little importance if only

a small percentage of wood is replacing concrete and steel, but it can have a bigger effect if a large percentage of wood is replacing concrete and steel.

5.6 Converting Agricultural Land to Plantations

One other option for supplying wood might come from converting agricultural land to wood plantations. Assuming land can be available for reforestation, we used CHARM to compare the climate benefits of establishing plantations and harvesting them for wood versus allowing secondary forests to regrow without harvests. Where we estimate that plantation growth rates are not significantly different from secondary forest growth rates, which are in the western United States and Germany, the better climate result is to support secondary growth. Where plantation growth rates are much higher, such as in the U.S. loblolly pine, Brazil, and Indonesia examples, the net effect of harvests is more beneficial than secondary forest regrowth. The reduction of emission with existing uses of wood is the largest in the U.S. loblolly pine example, and our 70 percent CLT examples have higher emissions reduction in Brazil and Indonesia (Table 8).

The critical additional question for these scenarios is under what conditions such a strategy would be beneficial. Unless agricultural land is declining globally—in contrast to the current situation in which agricultural land continues to expand—such strategies have a high risk of just shifting deforestation around, so that plantation development in one location leads to deforestation (and carbon costs) elsewhere.

Table 8 | Effects of establishing plantations on agricultural land relative to allowing secondary forests to regrow

SCENARIO	EXISTING WOOD USAGE			40% CLT			70% CLT			EXISTING WOOD USAGE			40% CLT			70% CLT		
SUBSTITUTION FACTOR	0.44 tC/tC									1.2 tC/tC								
DISCOUNT RATE	Carbon cost (tC/ha)		% change emissions	Carbon cost (tC/ha)		% change emissions	Carbon cost (tC/ha)		% change emissions	Carbon cost (tC/ha)		% change emissions	Carbon cost (tC/ha)		% change emissions	Carbon cost (tC/ha)		% change emissions
	4%	No discount		4%	No discount		4%	No discount		4%	No discount		4%	No discount		4%	No discount	
Agricultural land conversion to plantation																		
U.S. Southeast Loblolly-shortleaf pine	-1.3	4.2	-192	-4.4	-4.1	-153	-7.6	-13.0	-153	-2.0	2.2	-144	-7.5	-12.4	-125	-13.1	-27.7	-125
Brazil	-7.9	-8.4	-136	-39.1	-74.5	-141	-69.8	-140.4	-144	-14.3	-21.9	-117	-69.7	-139.3	-119	-123.4	-253.8	-121
Indonesia	-3.2	-13.1	-40	-6.9	-17.7	-35	-28.8	-64.8	-83	-12.0	-31.8	-71	-28.8	-64.0	-69	-67.2	-145.9	-92

Notes: Positive numbers show increases in emissions while negative numbers show reductions. Pink cells show results that are adverse for the climate while green cells show results that are beneficial for the climate.

Source: Carbon Harvest Model (assumptions set forth in Appendix A).

5.7 Summary and Lessons from This Analysis

Our analysis yields a few summary observations and related conclusions:

- **Similarity to other analyses:** In general, our analysis matches those of other researchers using the all-carbon-pools approach with net GHG costs.
- **Secondary forests and regrowth:** When harvesting secondary forests and allowing them to regrow, we find significant net increases in emissions when harvesting wood for construction if wood is used in typical proportions. That is also true if 40 percent of harvested wood can be used to replace concrete and steel. We only find small GHG savings in many forest types if 70 percent of harvested wood could be used to replace steel, and with a 1.2 substitution factor.
- **Slow plantations:** If plantation growth rates are not much faster than secondary forest growth rates, as in our Germany scenarios, harvesting additional wood even from plantations is either adverse or only achieves small percentage savings in our high-use (70 percent CLT) scenario.
- **Conversion to plantations; high plantation growth rates:** In scenarios that involve converting secondary forests to fast-growing plantations (typically in warm regions), we also find small percentage reductions. The exception is Brazil, where the reduction reaches 75 percent.
- **High savings percentage:** Our only scenarios that achieve high percentage savings for construction material, more than 60 percent, require three conditions: the 70 percent utilization rate, either use existing plantations or conversion to plantations, and high plantation growth rates, which only exist in warmer areas.
- **New plantations from agricultural land:** Where plantations are established on prior agricultural land, doing so would not generate savings unless the plantation growth rates are fast-growing and much higher than secondary forest growth.

Overall, our findings are consistent with those of the European Joint Research Centre for Europe. It reviewed the literature and concluded that at least for decades, increases in wood harvest to provide construction and other timber materials would cost more in lost carbon from forests than gained from material substitution (Grassi et al. 2021).

Our findings about fast-growing plantations in the tropics suggest that if and when the world is able to free up land currently used for agriculture, plantations for construction could become beneficial. At this time, however, there is no surplus of agricultural land to use for plantations. If land becomes surplus, the first need for plantations will likely be just to meet growing demand for wood for other purposes. There will also be other competing uses, including plantations for bioenergy with carbon capture and storage. In addition, there is a good chance that emissions from concrete and steel will decline over time due to the many opportunities for reducing their emissions. That would make the use of wood for construction less beneficial. If and when net agricultural land declines, careful analysis will be required of the competing benefits of alternative land uses based on the information that becomes available at such a fortunate future time.

6. Potential Solutions for the Global Competition for Land: Produce, Protect, Reduce, and Restore

Our review indicates a massive and growing demand for land to produce food and wood products and to accommodate growing urban areas. The potential land conversion between 2010 and 2050 numbers in the hundreds of millions of hectares even with robust agricultural yield growth, plus hundreds of millions of hectares to be harvested for forest products.

Our estimates of forest carbon loss by 2050 under BAU suggest around 10 $GtCO_2e$ per year. These carbon losses include at least 3 Gt from the annualized cost of forestry over a period of 40 years after harvest. Due to various accounting protocols, these carbon losses from forestry are typically not counted in global analyses, mostly because they represent avoided carbon sequestration; nonetheless, they are real costs of human activity.

At the same time, modeled pathways to keep climate change below 1.5°C nearly all call for eliminating emissions from land-use change, along with large-scale ecosystem restoration. Avoiding large-scale species extinctions requires restoring native habitats instead of clearing more. Balancing these conflicting land demands is essential to achieving several of the Sustainable Development Goals in tandem, including goals around hunger, human health, energy, forests and terrestrial ecosystems, and the climate.

6.1 What Are the Solutions?

In *Creating a Sustainable Food Future*, we explored these issues extensively while focusing on the challenge of feeding 10 billion people by 2050. Our analysis suggests that the solutions to managing the global competition for land for agriculture fall into four categories, which also apply to other drivers of land-use change (e.g., wood demand growth and urban expansion). These categories can be summarized as "produce, protect, reduce, and restore."

- **Produce** means to produce more land-based goods and services on the same land, including boosting agricultural productivity, increasing urban density, and producing more forest products per hectare affected while at the same time reducing GHG emissions and other environmental impacts.
- **Protect** means using these land-use efficiency gains to protect remaining forests and other native habitats.
- **Reduce** means reducing the demand for land and land-based products, such as reducing food loss and waste, shifting to plant-rich diets, and recycling paper.
- **Restore** means both improving damaged forests and habitats so that they provide the maximum benefits for climate and biodiversity and reforesting those agricultural lands that provide little food and have little improvement potential but that could be restored to healthy forests or other habitats. Over time, if agricultural land demand can be reduced even as the global population grows, larger restoration efforts become appropriate.

6.2 Produce and Reduce Strategies

Managing the global land squeeze requires reducing the pressure to convert more native habitats to human uses. That occurs partially by doing more to meet those human demands on existing land and partially by reducing the demand for products that require land, particularly those that require a great deal of land relative to their benefits. We refer to these types of solutions as produce and reduce. We discuss these solutions first for food and other agricultural products, from which we can borrow from *Creating a Sustainable Food Future*, and then address the growing demand for urban land and for forest products.

6.2.1 Food and agricultural products

In *Creating a Sustainable Food Future*, we developed a menu of different strategies (Figure 25) to implement produce, protect, reduce, and restore globally. Solutions to accelerate agricultural productivity growth beyond historical rates, further reducing agricultural land demand, include the following:

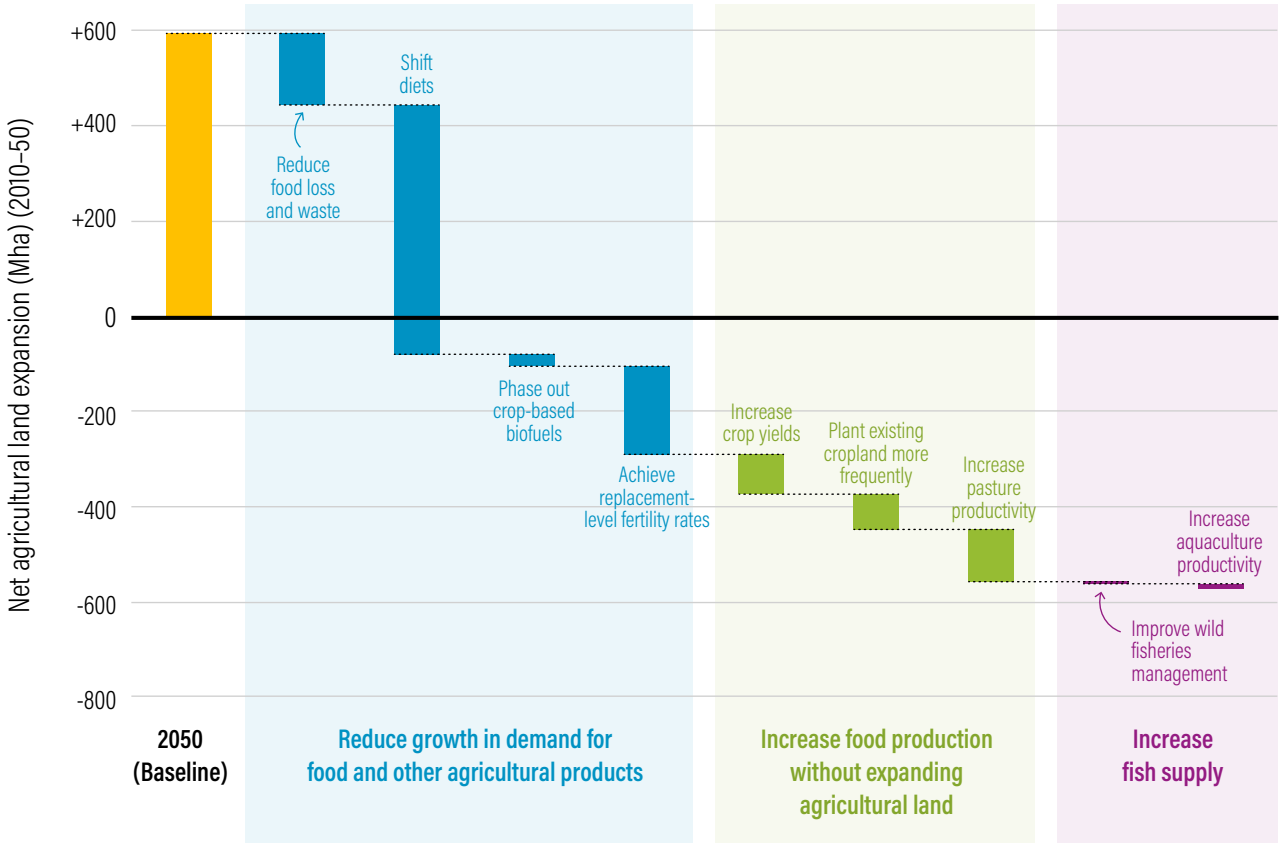
- **Increase livestock and pasture productivity.** Land-use requirements per kilogram of beef produced vary by a factor of 100 across all countries. That means there is great potential to improve performance of low-productivity systems, particularly across the tropics. Improved feeds (including pasture grasses), animal breeds, veterinary care, and grazing practices can all increase pasture productivity, helping to meet growing meat and milk demand while reducing pressure on forests.
- **Improve crop breeding to boost yields.** Crop breeding is responsible for roughly half of all historical yield gains. New technologies create new opportunities to accelerate yield gains while also adapting crop varieties to a changing climate.

- **Improve soil and water management.** Agroforestry, silvopasture, and rainwater harvesting can help revitalize degraded soils and boost yields in some areas, such as the African Sahel. Collectively, we estimate that accelerating crop yield gains through breeding and improved soil and water management could reduce agricultural land demand by 200 Mha.
- **Plant existing cropland more frequently.** More than 400 Mha of cropland go unharvested each year, whereas 150 Mha of cropland is planted twice or more each year (FAO 2020a). Increasing double cropping and decreasing fallow times can help reduce agricultural land demand. However, water constraints can limit such opportunities. Increasing cropping intensity by 5 percent beyond BAU could reduce agricultural land demand by around 70 Mha.
- **Sustainably increase fish supply.** Fish demand is projected to increase by nearly 60 percent between 2010 and 2050, but the global wild fish catch peaked during the 1990s. Improving wild fisheries management and raising the productivity and environmental performance of aquaculture can help meet growing fish demand while protecting marine fish stocks and reducing the land needed to grow crop-based aquaculture feeds by 14 Mha.

Several major strategies exist to reduce demand for agricultural land:

- **Reduce food loss and waste.** Roughly one-third of all food produced is lost or wasted between the farm and the fork (Gustavsson et al. 2011). Reducing food losses in developing countries would primarily occur through improvements to harvesting equipment, low-cost cooling and storage technologies, and improved infrastructure between farm and market. Reducing food waste in developed countries results primarily through "nudges" to consumer and corporate behavior, such as cafeterias without trays, and clearer distinctions between sell-by and use-by dates. Cutting overall food loss and waste by 50 percent could reduce land demand by more than 200 Mha.

Figure 25 | An extremely ambitious menu of food and agriculture solutions could theoretically reduce land demand by 800 Mha while feeding 10 billion people



Source: GlobAgri-WRR model in Searchinger et al. 2019.

- **Shift to healthier, more sustainable diets.** Per gram of edible protein, beef production uses 20 times the land as plant proteins such as beans. In countries with high meat consumption, shifting to more plant-rich diets can reduce per capita diet-related land use and "open up" planetary space for the world's poorer consumers to moderately increase their consumption of animal-based foods. Limiting consumption of beef and other ruminant meats to no more than 1.5 burgers per person per week in all regions could reduce land demand by around 500 Mha relative to BAU.

- **Phase out crop-based biofuels.** As discussed in Section 4, dedicating land to bioenergy production is an inefficient way to produce energy and increases the food production challenge and overall GHG emissions. Instead of increasing biofuel mandates and targets, governments should instead phase them out and only source bioenergy from wastes and residues. Doing so would reduce agricultural land demand by 24 Mha and, perhaps even more importantly, avoid any additional land demands from further expansion of biofuel policies.

Some advocates for bioenergy claim that increased demand for land is permissible because people can turn to "marginal land." However, although some of these lands might be called “marginal,” their improvement already is built into these “produce” strategies and, as discussed in Box 7, cannot justify deliberately increasing the global demand for land for bio-energy or other products.

- **Achieve replacement-level fertility rates.** Expected population growth of nearly 3 billion people between 2010 and 2050 drives the majority of the projected food demand increase (and is a key driver of increases in wood demand and urban expansion as well). If all world regions reached replacement-level fertility by 2050 (i.e., 2.1 children born per woman), the population would only grow to 9.3 billion by midcentury. Experience from all world regions shows that a combination of strategies (increasing educational opportunities for girls, increasing access to reproductive health services, and reducing infant and child mortality) has led to voluntary reductions in fertility rates. Rapid reductions in fertility also can play a major role in helping developing countries start a period of sustained economic growth because a much larger share of the population is of working age. A cobenefit of these important health and education measures is a reduction in agricultural land demand of 180 Mha relative to BAU.

BOX 7 | Can "Marginal" Land Justify Policies That Increase Demand for Land?

It has become common for papers to claim that desired additional land uses, such as for bioenergy, forest products, meat consumption, or lower-yield agriculture, are possible because they can just use "marginal" land or, if they use agricultural land, agriculture can just expand into marginal land. In its report *Creating a Sustainable Food Future* (Chapters 7, 17, and 19), the World Resources Institute reviewed these claims and found, in effect, that large areas of potentially productive, essentially unused land do not exist and, in any event, that all potentially productive land has a high opportunity cost and is not free to use to meet policy-induced increases in demand.[a]

As reviewed in that report, there are certainly lands that are underperforming, including some with soils that have become physically degraded in one way or another. But these lands are nearly all still in some use. Some are agricultural lands that are or will become abandoned and revert to forests, sequestering carbon. Others will remain in agricultural use, but their improvement is one of the core means of meeting rising human demands for food and fiber without clearing more native habitats. They are therefore not "free" to meet additional human demands beyond what is already expected under business as usual.

As discussed in *Creating a Sustainable Food Future*, several categories of land have frequently been referred to as marginal or degraded. Sometimes, the term is applied to broad estimates by experts of the percentage of agricultural lands that they consider to be suffering from some level of soil degradation.[b] Often the term is applied to large portions of the world's grazing lands—if they are viewed as marginal for cropping—but it ignores their use to meet human demands for ruminant meat and milk. Sometimes the term is applied to abandoned agricultural land, ignoring the fact that the reforestation of abandoned cropland plays a critical role in holding down net deforestation.[c] Sometimes maps of marginal land are created by overlaying maps that seek to estimate lands with good and bad cropping potential over maps of agricultural land. Unfortunately, there are likely to be large errors in each of these maps, so when one is overlaid with another, some good agricultural lands will appear to be in fact marginal. The result can be maps that declare vast areas of agricultural land as marginal, including some of the better agricultural land in the United States.[d]

Other papers try to define marginal lands based on economic returns, treating land as marginal for one use if it could be more profitable in another use. (Khanna et al. [2021] summarizes these papers and one approach). This approach ignores the cost in lost carbon of replacing any forgone food production. Land can have relatively low financial value if its food can be replaced relatively cheaply somewhere else. One reason for that is because it is relatively cheap to replace the food by converting forest or other land to agriculture; thus, using this land may be cheap financially, but not from a carbon perspective.

There have also been suggestions that land that comes in and out of farm production should be deemed marginal. But much of this type of land is in rotation and is typically farmed that way for reasons such as the need to fallow it at times to replenish nutrients or water. Unless this type of land would be replaced by land not in rotation, using it for a new purpose will not lead to more efficient land use. Some of this land is also the farmland that tends to be farmed when prices are high but not when prices are low. In the future, prices will almost certainly continue to fluctuate because of weather patterns or other vagaries. Using this land for additional purposes will just require that additional land be brought into production in occasional years. Moreover, finding ways to farm land more frequently, increasing its so-called cropping intensity, is already an important strategy to meet rising food needs without expanding agricultural land, so using only occasionally farmed land for purposes other than meeting rising food demands reduces the potential to achieve this goal.

Another common pattern is to identify low-yielding tropical grazing land as marginal, and there is strong evidence that much grazing land in Latin America could be greatly improved and support much higher yields.[e] But as discussed elsewhere in this report, vast increases in yields on these lands are already required to meet rising demands for ruminant meat and milk. Some are likely also sufficiently degraded, or unimprovable, that their best use is to be restored as natural habitat, and maybe even some could be appropriately used as forest plantations to help meet rising wood supply. And if some combination of yield gains and demand reductions could reduce the need for such pastures in the future, these are the lands whose reforestation is most typically identified in papers about "nature-based solutions" to climate change.[f]

The key point is that even being degraded or marginal in these ways does not make these lands "free" in the sense of lacking an opportunity cost. These lands are already needed to meet rising demands for food, for wood to use to sequester carbon, and to restore biodiversity in native landscapes. They are not free to use to meet additional demands created by policymakers, such as for bioenergy, except at the cost of not being available to help meet all these other rising demands.

Sources: a. Searchinger et al. 2019; b. Gibbs and Salmon 2015; c. Smeets 2008; d. Cai et al. 2011; e. Strassburg et al. 2014; f. Griscom et al. 2017.

6.2.2 Urban expansion

The world's urban areas are growing not merely because of population growth but also because their density is declining. Rates of urban land expansion are exceeding rates of population growth in every region. Between 1990 and 2015, one study found that urban densities in developed countries were declining at a 1.5 percent annual rate and by 2.1 percent in less developed countries (Mahendra and Seto 2019). Another paper found that in Europe, China, India, and North America, declining population densities caused 12.5 Mha of additional land to be converted to urban uses between 1970 and 2010 (Güneralp et al. 2020).

Even so, both the overall density of cities and growth patterns vary widely, and the cities that use the most land per inhabitant are in the wealthiest regions. Asian cities average between 10,000 and 20,000 people per square kilometer. Latin American cities use twice as much space per person, European cities use 3 times as much space, and U.S. cities use 10 times as much. An extensive literature has found that expanding housing in this way is gratuitously expensive and often results in large areas without adequate services and lengthy commutes that are expensive in personal time and social interactions. One report estimated that promoting denser growth patterns by 2050 could save $17 trillion (Global Commission on the Economy and Climate 2018).

Several WRI reports explore the challenge of promoting denser, more livable cities (e.g., Mason 2017). As emphasized in "Upward and Outward Growth: Managing Urban Expansion for More Equitable Cities in the Global South" (Mahendra and Seto 2019), the solutions involve not merely encouraging density but doing so in equitable ways with adequate services and other amenities. The literature on urban sprawl identifies several areas for reform. There are four core tools: infrastructure funding, land-use regulations, taxes and other financial incentives, and property rights. Recommendations include the following:

- Reform distorted land markets that encourage inefficient speculation by regularizing informal land titles and reforming a variety of policies that otherwise allow displacement of poor, peri-urban communities and inefficient expansion.
- Use land-use regulations, financial incentives, and infrastructure development to encourage compact development with adequate services, integrating where people live and eat with where they work.
- Create public-private partnerships for development in targeted areas.

6.2.3 Wood demand

In part because of the flawed accounting regarding forest carbon in previous studies (as described in Sections 3–4), we are aware of no thorough analysis of a global strategy for reducing likely future impacts on forests and their carbon. As a whole, the evidence supports a "produce and reduce" strategy for addressing growing demand for forest products.

Reducing wood demand has value even if increased demand for wood causes forest owners to manage forests more intensively or to establish more plantations because those land uses still compete with other land uses. More intensive management sacrifices biodiversity. Increased plantation forests come at the expense of using land for food production, natural forests, or other biodiversity needs. Although improved management may be one way to meet wood demand with fewer environmental effects, that does not mean that more forest harvesting is better than less harvesting.

Several strategies exist to reduce the demand to harvest more wood while still meeting human needs, and we address these "reduce" strategies first.

Increase the efficiency of wood processing. Although the percentages vary, we estimate from FAO data that roughly 40 percent of industrial roundwood intended for sawn wood, wood-based panels, and paper and paperboard is burned as some kind of waste without getting into one of

those products. This estimate is uncertain because some FAO data are inconsistent. But the estimate is consistent with general technological estimates that around half of wood used for wood pulp is burned as a waste and half of wood sent to sawmills is not used, although much of that sawmill waste can be used for wood-based panels or wood pulp (FAO et al. 2020). Over the last several decades, improvements have been made that allow more of the wood harvest to be used for timber products. There is undoubtedly some continuing potential to increase efficiencies in wood use, and these more efficient uses should be encouraged.

Recycle and reuse wood. The effort to reduce demand for forest products is reflected in global paper recycling. Advanced through government policies, recycling rates for used paper have grown greatly. According to a company that closely tracks the global forest industry, recycling rates reached 47 percent in 2012. In Europe, paper recycling increased from 40 percent in 1981 to 72 percent in 2019 (Recovery Worldwide 2019). Recycling rates are roughly 70 percent in the United States and 80 percent in Japan (EPA 2017).

Paper recycling has disproportionate benefits beyond the percentage recycled. It takes less carbon from recycled paper to produce one ton of pulp than raw wood (because the lignin in raw wood cannot be used). And because most recycled fiber can then be used again, the net savings can continue. Overall, paper fibers are used on average 3.6 times in Europe and 5–7 times in the United States, and the global average is 2.4 times (EPA 2016; Recovery Worldwide 2019).

Recycling rates in developed countries cannot grow endlessly. Fibers cannot be endlessly reused, and most paper products require some virgin fiber; likewise, some paper (such as tissues) cannot be safely recycled. Globally, however, there remains significant room to increase both recycling overall and the percentage of that recycled paper used for paper. Even in countries such as the United States, much of the paper is not reused for paper production but for other products.

In addition to recycling, the potential also exists to reuse more solid wood. For example, Höglmeier et al. (2013) found that in southeastern Germany, one-third of the wood from old buildings could be recycled into high-value products, but only a small amount was being used in this way. There are also creative ideas to turn wood waste into composite that can replace some cement (Berger et al. 2020).

Use wood products more efficiently. When wood consumption is replaced by a nonwood product, the net results are complex, as our analysis of construction timber suggests. But one way to reduce wood consumption is merely to reduce the quantity of wood used for a given purpose. The switch to computers has substantially reduced the demand for true paper, including newsprint. But printing and writing paper, which is still 30 percent of pulp and paper consumption, contains on average only 8 percent recycled paper content (Martin and Haggith 2018). Reductions in its use are therefore disproportionately valuable.

> In part because of flawed [carbon] accounting … we are aware of no thorough analysis of a global strategy for reducing likely future impacts [of wood demand] on forests and their carbon. As a whole, the evidence supports a "produce and reduce" strategy for addressing growing demand for forest products as well.

Packaging is now 60 percent of all global paper and paperboard use (FAO 2020a), and there are numerous examples of companies reducing the quantity used for each package. The Environmental Paper Network (Martin and Haggith 2018) gives the example of Hewlett Packard, which redesigned its printer packaging to reduce the volume of material by 90 percent.

Reduce the use of fuelwood. As discussed earlier, the additional harvest of wood to burn for energy increases emissions for decades even when it replaces coal in industrial power plants and heating facilities. A goal should be to burn wood products only as a last resort in the use of processing wastes and not to harvest wood intentionally for direct energy use. In the developed world, the increased use of wood is being driven by climate-motivated laws that treat biomass as being carbon neutral (Searchinger, Beringer, et al. 2018). Critical reforms are needed to properly account for the carbon from harvesting wood (as discussed in Section 4 of this report) and to develop additional simple rules, such as prohibiting incentives for the use of stem wood.

Even today, most fuelwood is used for traditional stoves and charcoal production in developing countries. This traditional use is particularly inefficient because open wood burning only directs a portion of its energy into heating food and because charcoal production is inherently inefficient. There have been a large number of initiatives to replace open fires with cookstoves, in large part because of health benefits, which have had mixed success (Sedighi and Salarian 2017; Suresh et al. 2016).

Overall, the degree of reliance on wood in developing countries appears to be closely correlated with the affordability and access to alternative energy sources. One important variable is the alternatives to biomass in rural areas of Africa that are not served by central electricity. A primary alternative involves a combination of solar cells and batteries. Electricity, of course, has additional benefits beyond cooking. Showing both the opportunity and limitations, one study estimated that roughly one-third of rural residents in Africa could afford electricity and would find solar cells and battery options cheaper than diesel generators (Szabó et al. 2021). That level of penetration would be significant, but another study finds even greater potential if batteries continue their declining costs (Batchelor et al. 2018). In general, efforts to promote decentralized rural electricity appear to have significant promise for reducing wood demand in the next several decades.

Beyond these strategies to reduce growth in wood demand, the principal alternatives involve more efficient production. These "produce" strategies are listed below. The options fall into two major categories: more efficient harvest or more efficient growth.

Harvest wood more efficiently. As wood is harvested, much is left behind as slash. Some of that slash is from the tops and branches of trees, and it generally constitutes around 30 percent of natural wood harvests. Other slash consists of small trees and other vegetation that is killed in the process of harvesting the wood. Harvesting is particularly inefficient in the tropics. A number of studies have estimated losses in the tropics, and a recent review in Ellis et al. (2019) estimated that, on average, for every 1.0 tC removed from the forest, 5.7 tC in wood are felled and left to decompose. The paper estimated that reducing that ratio of lost wood to 2.3-to-1.0 would reflect best practices and reduce 366 million tCO_2 per year. (These are gross emissions reductions and are not counted in our time-discounting way.)

In temperate forests, clear-cuts (either large or small) are a more significant mechanism for forest harvest, and slash rates are lower in clear-cuts. There are also benefits to some level of slash; for example, leaving slash behind in a forest helps provide habitat benefits. In addition, slash is generally left because it is not economical to remove it. Whether greater removal of slash is advisable requires closer analysis of these different costs and benefits.

Grow more trees on farms to supply fuelwood. One question is whether increased growing of trees on farms can become a larger source of fuelwood without reducing agricultural production. In India, some studies have estimated that trees on farms provide two-thirds of the fuelwood (Singh et al. 2021). In general, the

idea is that growing trees on field borders or in degraded or nonproductive parts of farms can provide additional benefits without sacrificing food production. Although that is not always the case (Ivezić et al. 2021), some forest buffers can enhance yields by blocking wind (Osorio et al. 2019), shading livestock in hot countries, or increasing nitrogen-uptake in the case of nitrogen-fixing trees as discussed in *Creating a Sustainable Food Future*. A variety of options exist for farmer-assisted natural regeneration, such as excluding cattle from certain areas. Just planting more trees in farms is not an automatic solution, as it can displace food production, but it should be pursued where it can be done in ways that preserve or enhance food production.

Rely more on plantations with more intensive management. The other major option is to shift more and more wood production to plantations. This shift is already a major global trend (McEwan et al. 2020). The basic reason is that plantations can deliver more wood per hectare per year. Plantations produce straight trees that can be harvested more efficiently. They can use new varieties of trees that are bred to grow faster. And they can use fundamentally fast-growing trees, such as species of eucalyptus, acacia, and bamboo, and plant them in place of slower-growing trees.

The advantage of plantations has also been growing. The most intensively managed eucalyptus plantations in Brazil can generate three to four times the aboveground biomass growth rate even of regenerating tropical forests. Brazil's plantation growth rate is 6.1 tons of carbon (tC) per hectare per year, and its secondary forest growth rate ranges from 1.2 tC/ha/year for mature forests to 3.7 tC/ha/yr for young forests (Harris et al. 2021). In the southeastern United States, the growth rates for intensively managed loblolly pine trees have been consistently increasing (Ince 2000).

Although plantations come with this advantage, they have other high costs, as discussed elsewhere in this report. Biodiversity is much lower in plantations than in natural forests. More intensive management nearly always means even shorter rotations, less wood in any form other than the intended trees, and ever lower biodiversity. Plantations can use so much water that they draw

out streams and other water supplies (Hoogar et al. 2019; Trabucco et al. 2008). Plantation forests are also a prime driver of peatland drainage, occupying an estimated 12 Mha—roughly one-third of drained peatlands globally (Biancalani and Avagyan 2014). This use suggests that plantations located in drained peatlands are responsible for more than 300 million tons of ongoing carbon dioxide emissions per year based on global estimates of peatland loss rates (Biancalani and Avagyan 2014; Searchinger et al. 2019).

From a carbon standpoint, our analysis shows that shifting to plantations would reduce carbon costs in many areas. This is particularly true if the shift would be to highly managed, intensive plantations. The prevailing view is that shifting to intensive plantations would also have large biodiversity benefits if doing so resulted in leaving natural forests alone (Burivalova et al. 2014), particularly intact forests (Betts et al. 2017). However, we are unaware of any rigorous analyses to support that view, which suggests an important direction for future research.

The benefits of shifting to plantations obviously depend on several factors, including where the plantations are located. The spread of acacia plantations in peatlands in Southeast Asia is an example of the extreme damage to both climate and biodiversity that forest plantations can create, so improving siting of new plantations is critical. Even when plantations are established on prior agricultural land, as the experience in China illustrates, these plantations can be part of an overall global dynamic in which food production shifts and leads to the clearing of natural forests elsewhere. And any biodiversity benefits are only realized if greater plantation use means leaving other forests undisturbed.

From a purely biophysical standpoint, the potential benefits of using intensive forest plantations to replace natural tropical wood harvests are likely to be high. One reason is that typical tropical forestry operations now kill around 4.5 times as much aboveground wood as they harvest (Ellis et al. 2019), whereas plantation harvests are much more efficient and result in much lower damage to trees. Perhaps even more importantly, the indirect effects of road building and forest clearing in tropical forests on both carbon and biodiversity are vast, with carbon impacts sometimes estimated at 6 times that of direct effects (Maxwell et al. 2019).

We estimate that industrial wood harvesting that occurs over time in hundreds of millions of hectares of tropical secondary and primary forests produces only around 14 percent of the global wood harvest. From the standpoint of sheer volumes of wood, that 14 percent could be replaced by only 6.1 Mha of additional tropical plantations (author calculations using CHARM). Yet harvests of tropical forests focus on quantity as well as quality, seeking valuable hardwoods. It seems likely that plantations can help save natural forests from being harvested, but getting good governance in place is likely to be important as well.

Most environmental public policy related to tropical forests has been based on the concept of sustainable forest harvesting with reduced-impact logging. Changing forest protection strategies by shifting away from trying to make harvests of natural tropical forests sustainable in favor of relying on plantations would be a significant policy shift. One key issue would be compensating local people the potential income from logging in primary and secondary forests, which could be a good use of funding intended to compensate for forest protection in low-income countries. Another key issue is establishing the enforcement mechanisms to protect forests, which is complicated by the failure by most governments to fully recognize customary property rights of those who live in forests (Notess et al. 2018). A third issue, more related to wood supply, is to replace these natural tropical hardwoods by a combination of technologies to make quality furniture from other woods, and through tropical hardwood plantations, such as teak. A full-scale analysis of realistic, comprehensive strategies to reduce the carbon and biodiversity costs of meeting wood product demand remains to be performed.

Avoid creating new wood demands. This challenge of meeting rising wood demand under BAU creates the challenging context of adding demand for mass timber for construction. For the reasons articulated in our discussions of mass timber, our results are generally skeptical about

the potential climate benefits of mass timber for three reasons. First, the conditions for significant climate benefits are limited and nearly all require more wood plantations. Second, the potential GHG emissions reductions from replacing concrete and steel with wood can be greatly reduced if progress is made in reducing emissions from concrete and steel. And finally, given growing demands for wood and land-based products overall, the first use of additional plantations should be to meet rising demands for wood.

6.3 Protect and Restore Strategies

Uses of land are driven not only by the demand for land but also by its "supply." The demand for land is based on the demand for food and agricultural products, forest products, and urban uses. The supply of land refers to the overall cost of using land for these purposes, which reflects such factors as legal restrictions and physical infrastructure such as roads. If governments make it easy to clear more forests, for example by building roads, the incentives to produce more food on the same land will decrease, undermining efforts to increase yields.

Efforts by themselves both to increase production on the same land and to reduce demand also can have rebound effects. If increased yields reduce the cost of producing a food—which depends on the causes of that yield increase—prices will decline, and people may consume more. If so, cropland area may not decline as much as without the price effect. In *Creating a Sustainable Food Future*, we explained why this price effect should generally not be a concern. This is partially because food consumption is inelastic and responds in a limited way to price, so increasing efficiency and reducing prices will generally have a limited effect on food consumption. And it is also true because achieving global food security requires providing adequate food for even the poorest consumers, who are the most responsive to food prices. But evidence shows that beef consumption is more responsive to price effects, probably involving trade-offs and substitution with other livestock products. Without efforts to limit land expansion, it is therefore possible that many of the land-use reductions expected from more land-efficient beef production could be erased by higher beef consumption.

Disproportionate increases in agricultural yields in regions that have abundant forests and productive savannas could also encourage global shifts in locations of agricultural land. For example, once Brazil and Argentina developed ways of growing soybeans with yields similar to those in the United States, they became more competitive globally and could sell more soybeans to China and Europe. That phenomenon led to an expansion of soybean area in Latin America. This shifting in agricultural land location increases the land that can be reforested in wealthier countries but at a disproportionate cost in both carbon and biodiversity through new land clearing in the tropics.

6.3.1 Protecting native habitats

Because of these challenges, efforts to boost yields must be closely linked to efforts to protect native landscapes. Linking "produce and protect" can mean specific conditions, such as those enacted previously in Brazil that restrict agricultural credit to farmers or municipalities that comply with forest protection legislation. Wealthier countries can also increase their agricultural assistance, or provide favorable trade rules, to those countries that protect forests. International food companies should not only avoid purchasing food produced on recently deforested land but also actively work with their supplying farmers to boost yields enough to avoid contributing to global land expansion.

6.3.2 Regulating forestry

Protect strategies also apply to forest products. As in the case of food, just reducing demand alone is unlikely to fully protect forests, and strategies to protect them are also necessary. Protection strategies (when coupled with demand strategies) can make it harder to harvest wood, pushing for strategies to better harvest and use other wood resources. Protection strategies can also help avoid the most harmful and wasteful forms of harvesting.

International efforts for decades have focused on governance, prohibiting illegal wood harvests. Doing so is important both to enable any

governance strategies to succeed and because illegal wood harvests are the most likely to be done in harmful and wasteful ways (Barber and Canby 2018). Another important strategy is securing community land rights, which is not only critical to be fair to indigenous communities and other rural people but can lead to greater forest protection (Veit 2019). As WRI has discussed elsewhere, governments have mechanisms for recognizing such rights but have been far too limited in doing so.

6.3.3 Restoring forests, peatlands, and other high-priority habitats

Efforts to restore forests and other habitats are also important. These efforts fall into two categories: those that should occur immediately, and those that can only occur if success in "produce and protect" strategies reduce the demand for agricultural land.

Forests in urban areas, which have modest overall benefits for the climate but provide a variety of other health and social benefits, have some potential for improvement. Opportunities exist to restore trees on farm boundaries and within agricultural fields in silvopastoral and other agroforestry systems that not only do not reduce food production but can sometimes enhance it (Montagnini et al. 2013). Some studies have also claimed a significant potential to restore forests on lands that are neither forests nor agricultural lands (Fargione et al. 2018). Such studies typically rely on overlaying different remote-sensed maps and would benefit from actual surveys of field conditions to determine present uses.

Degraded habitats in protected areas, such as parks and wildlife areas, need to be better protected and restored. These are areas intended to serve natural purposes, but there is abundant evidence that many are degraded and invaded (Dasgupta 2017; Laurance et al. 2012).

Some agricultural areas are not only marginal for food production but also face strong limits to their improvement, such as the low-productivity pastures located on high slopes in parts of Brazil dominated by the Atlantic Forest. The likely carbon sequestration benefits of reforestation in the area exceed the carbon costs of any reduced food production (Searchinger, Wirsenius, et al. 2018).

Larger-scale restoration is an important climate change strategy, but doing so can only occur if the world is able to free up agricultural land by the methods we describe above (e.g., boosting productivity, reducing food demand growth). Several papers claim vast restoration potential without addressing the challenge of reducing agricultural land demand. Bastin et al. (2019), for example, prominently estimated a large potential to mitigate climate change by restoring forests, but they did so mainly by identifying pasture that was historically forested—even though the paper claims to have excluded all "agricultural land." Such an analysis implicitly treats vast parts of the world's agricultural land as though it is not producing food that would otherwise need to be produced elsewhere. Griscom et al. (2017) also relied primarily on reforesting such lands and made only brief citations to papers that claim some potential to increase pasture output and reduce demand for beef. Overall, the world's ability to protect its remaining natural ecosystems and restore ecosystems at the scale needed to keep warming below 1.5°C is closely linked to and dependent on its ability to implement "produce" and "reduce" strategies at unprecedented (though theoretically possible) scales.

7. Conclusion and Key Takeaways

The world is facing a land squeeze as the global population grows to 10 billion people by 2050, incomes rise, and people move to cities. BAU projections involve massive increases in land-use demands and associated losses of carbon that would put the global goal of limiting temperature rise to 1.5°C out of reach.

Many climate strategies that involve land ignore this global land-use competition and focus only on localized analyses that ignore system-wide effects of new uses of land-based products. Even analyses that use global models often hide adverse effects in their results, such as reductions in food consumption by the poor to compensate for additional uses of land by the rich (e.g., bioenergy). Some assume that yield gains can compensate for increased demand for land for other nonfood uses, even though those same yield gains are already required to meet rising food and wood product demands without further deforestation.

There is potential to improve the use of many lands, but no land use is "free." All land capable of growing plants well has a high carbon opportunity cost (the carbon potentially stored in native vegetation), which should be factored into analyses of carbon benefits and costs of alternative land uses. For example, planting tropical forest plantations on existing grazing land might be a carbon-efficient way of using that land, but that land is not currently free for the taking, especially in a world with a growing population and food demands. Large increases in meat output per hectare and major dietary shifts are probably needed to free up such lands.

Our analysis casts serious doubt about any potential policy that would spur additional land demands above and beyond BAU demands for food, wood, and urban areas. Strategies focused on increased bioenergy and wood use for construction have nearly always been justified by climate analyses that treat biomass as "carbon neutral," meaning that they neither count the loss of carbon in forests and other terrestrial vegetation nor count the release of carbon when this biomass is burned or decomposes. The potential for such policies to intensify land-use competition is also vast. Strategies for supplying 20 percent of the world's energy from bioenergy would require doubling the harvest of plant material on top of all the additional uses of plants and land discussed in this report. Producing 50 percent of new urban construction with wood would likely require more than a 50 percent increase in uses of industrial roundwood. These levels of competition, along with the vast competition already inherent just from rising incomes and population, pose enormous challenges for both the climate and biodiversity.

Our analysis also shows that "sustainable forest management," as conventionally understood, does not mean that wood use is carbon neutral or that using wood in construction in place of concrete and steel necessarily provides a net climate benefit. Harvesting wood comes with a time-discounted cost in lost carbon in the forest. The climate benefits of harvesting wood include the storage of some of that forest carbon elsewhere and avoided emissions from other carbon-intensive products such as concrete and steel. But the climate costs are reduced storage of carbon in the forest.

According to our analysis, large net climate benefits from wood harvesting probably require that a high percentage of this wood is used to replace concrete and steel in construction—perhaps at levels not realistic—and that the wood come from or be associated with the establishment of fast-growing forest plantations. If these plantations come at the expense of natural forests, they would have high biodiversity costs. In the future, plantations to produce wood for construction might be established on agricultural land that is no longer necessary for food, but those uses should be evaluated against other demands for land, including ecosystem restoration, bioenergy, or using the same plantations to meet other rising demands for wood products.

There are possible technical strategies to feed and house 10 billion people by 2050 while halting deforestation and making land available for forest restoration or other uses. Scenarios that achieve these goals are highly ambitious and their success uncertain, requiring unprecedented growth in agricultural productivity and changes in food consumption patterns. In general, our analysis suggests that it is not appropriate to enact policies to spur increased demand for land-based products (e.g., wood for construction) until strategies to meet BAU food and wood demands without further land clearing have been proved successful.

APPENDIX A: CHARM: DESCRIPTION AND METHODS

CHARM is a biophysical accounting model developed for this report that provides two outputs: the estimated land area requirements to meet wood demands and the estimated GHG implications of meeting those demands, both of which can vary according to different methods of growing, harvesting, and using wood. The model can be used at the forest-stand level to analyze the GHG consequences over time of different forest growth patterns, harvests, wood use, and forest regrowth. The model can also be used to estimate national and global land-use and GHG consequences of meeting different levels and types of different wood product supply and demand scenarios in the future. The model is designed to be transparent, so that it is easy to evaluate alternative scenarios and the effect of different parameters and assumptions. The principal version of the model runs in Python using input files from Excel.

Land requirements are defined as the area of plantation and of nonplantation forests harvested over a given time period of focus, which initially is between 2010 and 2050. We chose 2010 as our base year to be compatible with the agricultural modeling results of the World Resources Report *Creating a Sustainable Food Future*. The present version of the model uses an optimistic assumption that all forests harvested will be from secondary forests rather than primary forests, which are typically more carbon dense. To estimate land-use requirements to meet wood product demand, the model starts by segregating wood product demand into three broad categories: LLPs, which are essentially wood for construction and furniture; SLPs, which are paper and paperboard products; and VSLPs, which are various forms of bioenergy. The model starts with existing wood sources and demands as of 2010. Demands for different wood products are aggregated into total wood demands by country (using factors that translate each ton of a wood product into a ton of industrial roundwood harvested that accounts for processing losses.) Wood supply each year is met based on the average wood supply available per hectare in that year. In the scenarios analyzed to date, the model separates wood supplied by existing plantation forests and wood supplied by secondary forests, each based on their harvest efficiencies and growth rates.

To estimate land-use requirements, the model assumes that all harvesting is achieved through at least small clear-cuts. (The model also allows for thinning of forests, but that is done on the same lands as those ultimately harvested and therefore does not increase harvest area counted.) The clear-cut assumption increases the wood harvest per hectare and therefore reduces the area affected by harvest. In the tropics, in particular, most nonplantation forest harvests occur selectively. However, there are problems of definition between selective harvests and miniature clear-cuts as well as uncertainties about the quantities of wood removed by different logging techniques. These uncertainties make it challenging to provide a precise estimate of area affected. The area of land use calculated by CHARM should therefore be viewed as hectares of clear-cut equivalent (i.e., the hectares that must be harvested assuming all hectares affected are clear-cut). One hectare counted by the model might, in reality, be several hectares selectively harvested.

The model also estimates the GHG consequences of meeting wood demands, and it does so both at the stand level and by analyzing the effects of harvests to meet future demands at the national and global levels. To estimate the effects on GHGs, the model tracks the flow of carbon between pools, following a basic approach employed by models developed during the 1990s, most prominently by Schlamadinger and Marland (1996). At the stand level, the model can be used to analyze any type of forest for any type of purpose with readily changeable parameters. At the national and global level, the model uses information about each country's forests and assumes that wood demand will first be met by plantations to the extent available and that secondary forests will be harvested for the remainder. The model tracks the carbon consequences of harvesting these forests under allocation and regrowth management rules specified by the scenario. When estimating future production, the model assumes that existing global trade patterns remain the same. For example, if timber-importing countries increase their demand, the model assumes that imports will grow proportionately and that exporting countries will proportionately increase their exports to meet this increasing demand.

A.1 Basic Model Structure

A.1.1 Establishing the 2010 reference for wood demand and use

CHARM starts with 2010 numbers by country for consumption and production of different wood products and harvest levels using data from FAOSTAT (FAO 2021). Based on the relationship between wood harvests and different wood uses, the model can estimate how harvest quantities in each country must change in response to changes in consumption of different categories of wood products. As demand changes over time, the version of CHARM used in this report keeps trade balances constant. For example, if a country imports 20 percent of its wood in 2010, the model assumes it will do so in 2050, and exporting countries will change their exports in response to meet import demands in proportion to their share of global exports.

Figure 10 re-creates the flow of wood harvests to wood products. Global roundwood harvests in FAOSTAT are divided into two major categories: industrial roundwood (FAOSTAT item code 1865) and wood fuel (1864). Industrial roundwood itself falls into three categories: generally larger logs that are sawn into timber or peeled to provide veneer, typically called "sawlogs and veneer logs" (1868); generally smaller logs harvested for paper, particleboard, and paperboard (e.g., cardboard), called "pulpwood" (1870 and 2038); and "other industrial roundwood" (1871) that is used for poles, piling, posts, fencing, wood wool, tanning, distillation and match blocks, and so forth. FAOSTAT always reports the production quantities for the above categories, but not all of them have import/export

quantities reported. Most of the time, only the two major categories, industrial roundwood and wood fuel, have both production and trade flow records.

The wood harvests provide the raw materials for manufactured forest products. Sawlogs and veneer logs are processed in sawmills and are then turned into sawn wood (1872) and plywood (1640). The production of sawlogs generates wood chips and particles and wood residues (1619), some of which are used for particleboard (1697), OSB (1606) and fiberboard (1874), and some are used for pulp production or are burned for energy. Pulpwood is primarily used for wood pulp (1875), and some of it is also used for particleboard and fiberboard. Wood pulp comes from pulpwood and wood residues from sawlogs, and it is used for about 40 percent of the raw materials for paper and paperboard (1876), where the remaining 60 percent is from recovered paper (1669) and other pulp (1668). In other words, both sawlogs and pulpwood can be used for particleboard, OSB, fiberboard, and wood pulp. Wood-based panels (1873), a commonly used aggregated primary forest product, are the sum of particleboard, OSB, fiberboard, and plywood. Wood chips and particles and wood residues (1619) exclude the chips in the production of pulp, particleboard, fiberboard, as well as chips counted as pulpwood, wood fuel, and other industrial roundwood.

In summary, sawlogs, veneer logs, and pulpwood are turned into sawn wood (SNW), wood-based panels (WBP), and wood pulp (WPL). We define these as main industrial roundwood (IND-M) products. Industrial roundwood (IND) is the sum of main industrial roundwood and other industrial roundwood (IND-O). Table A1 lists the main FAOSTAT items we use to calculate wood demand (consumption). In country *N (N = 1 ... 176)* at year *T*, we first calculated net exports by subtracting imports from exports. If exports or imports is missing from the data for a country, then net exports is set to "missing" and is not counted. We then calculated consumption by subtracting the net exports from production. If both production and net exports are missing, consumption is set to "missing" and is not counted. If either production or net exports is missing, consumption is set to "production" or "net imports" (– net exports), assuming the missing element is a gap filled by zero.

Closing the material balance using FAOSTAT requires significant effort. We first convert the units when the items are not in cubic meter solid volume. The unit of wood pulp or paper is converted from metric tons (10 percent moisture content) to cubic meters using a conversion factor (= 1.87 m^3/ton):

$$CF = \frac{1 - MC_w}{\rho_b}$$

MC_W is the 10 percent moisture content and is the global average wood basic density 0.48 tons/m^3 derived from the FAO forestry products conversion guideline. Second, we identify whether there is missing data in other industrial roundwood, then we calculate other industrial roundwood using industrial roundwood minus the sum of sawlogs and veneer logs and pulpwood. If other industrial roundwood and either sawlogs and veneer logs or pulpwood are missing, then other industrial roundwood is set to zero. Third, we implement two tests of data quality for industrial roundwood at the country level. If a country in a given year does not pass either of the following criteria, we set the records as missing for all industrial roundwood products in this country: industrial roundwood supply and the consumption of wood products (sawn wood, wood-based panels, wood pulp) should be positive and/or total sawlogs domestic use (production minus net exports) should be greater than sawn wood production. Last, we set the quantity elements (production, consumption, net exports) for paper and paperboard or wood fuel as missing if its consumption is negative.

Wood products require much more roundwood than the actual quantity of the products. The production of industrial roundwood such as pulping and sawing, generates wood waste. Determining the amount of industrial waste is important for estimating the immediate carbon emissions for burning. We first checked reported

Table A1 | FAOSTAT items and elements

COUNTRY *N* IN YEAR *T*	INDUSTRIAL ROUNDWOOD (IND)	SAWNWOOD (SNW)	WOOD-BASED PANELS (WBP)	WOOD PULP (WPL)	OTHER INDUSTRIAL ROUNDWOOD (IND-O)	WOOD FUEL (WFL)
Production	Y	Y	Y	Y	Y	C
Net exports	Y	Y	Y	Y	-	-
Consumption	C	C	C	C	C	-

Notes: The data directly from FAOSTAT are labeled "Y," the statistics derived or calculated are labeled "C," and the unavailable or not required ones are labeled "-."

Source: Description of data sources used in Carbon Harvest Model.

conversion factors, such as the input-to-output ratio and the yield. The pulp yield is fairly stable. Based on the FAO forestry products conversion guideline, the global average input-to-output ratio for pulp is 3.58 m^3/ton, and the pulp weight to solid volume conversion factor is 1.87 m^3/ton (see above). The pulp waste in solid volume per ton of wood pulp becomes 3.58 – 1.87 = 1.71 m^3/ton, so the waste to roundwood percentage is 1.71/3.58 = 48 percent. In other words, around half of roundwood devoted to wood pulp is burned for energy use as waste. Similarly, the global average input-to-output ratio of other industrial roundwood is 1.4 m^3/m^3, which means about 29 percent of the other industrial roundwood is wasted.

For sawn waste, there is not enough reliable information to use that data directly from another source. We therefore developed a material balance approach to estimate the global and national industrial waste from pulping and sawing. Although FAOSTAT does not provide the data directly, we can derive them because the industrial roundwood domestic use (production plus imports minus exports) should be balanced by the sum of the production of sawn wood, wood-based panels, wood pulp, other industrial roundwood, the pulp waste that is estimated above, and sawn waste (Figure 10).

We calculate the actual pulp and sawn (PS) waste ratio in each country:

$$PS\ waste\ ratio = \frac{C_{IND} - P_{IND\text{-}O} - P_{SNW} - P_{WBP} - P_{WPL}}{C_{IND} - P_{IND\text{-}O}} = 1 - \frac{IND\text{-}M}{IND\text{-}PS}$$

where C_{IND} is the domestic use of industrial roundwood (production plus imports minus exports); $P_{IND\text{-}O}$ is the production of other industrial roundwood; $C_{IND} - P_{IND\text{-}O}$ is defined as industrial roundwood used for pulping and sawing *IND-PS*; P_{SNW}, P_{WBP} and P_{WPL} are the production of sawn wood, wood-based panels, and wood pulp; and the sum of the three is defined as the main industrial roundwood product *IND-M*. We gather all the records during the baseline period from 176 countries that have valid records and then derive the distribution of the PS waste ratio. We observed an average at about 48 percent between 2006 and 2014, and a standard deviation at about 22 percent. This estimate allows us to define hard boundaries for the waste percentage in each country.

We set a waste ratio minimum (10 percent) and maximum (70 percent) to determine whether a country has an excessive surplus or excessive deficit of industrial roundwood supply, which is likely the result of inaccurate wood accounting. If the PS waste ratio is negative (such as in China and Japan), the country does not have enough industrial roundwood supply. If the PS waste ratio is less than 10 percent, the efficiency is too high to be true. If the PS waste ratio is greater than 70 percent, the country may have excessive industrial roundwood supply, as the efficiency is too low. To adjust these unrealistic country-level imbalances, we cap the PS waste ratio to between 0.1 and 0.7. Therefore, we can invert the required quantity of IND-PS':

$$IND\text{-}PS = \begin{cases} \frac{IND\text{-}M}{1-0.7}, \text{PS waste ratio} > 0.1 \\ C_{IND} - P_{IND\text{-}O}, 0.1 \le \text{PS waste ratio} \le 0.7, \\ \frac{IND\text{-}M}{1-0.1}, \text{PS waste ratio} < 0.1 \end{cases}$$

When the PS waste ratio is less than 0.1, IND-PS' – IND-PS is defined as the additional consumption (additional production or imports) required for the country. When the PS waste ratio is greater than 0.7, IND-PS' – IND-PS is defined as the reduced consumption (additional exports) for the country to supply the need from the countries without deficits. There are three groups of countries regarding their waste ratios: Group 1 has reasonable waste (no adjustment needed, IND-PS' – IND-PS = 0), Group 2 has too much waste (IND-PS' – IND-PS < 0), and Group 3 does not have enough waste (IND-PS' – IND-PS > 0).

The first step is to adjust the net exports of the "net importer" countries (net exports < 0). For countries (e.g., China, Japan) that do not have enough waste (IND-PS' – IND-PS > 0), net exports will increase by the additional waste (IND-PS' – IND-PS). For countries (e.g., India) that have too much waste (IND-PS' – IND-PS < 0), we remove the extra waste from the net exports (IND-PS' – IND-PS < 0). After the first step, we calculate the world total industrial roundwood net exports, which need to be balanced by the exports from the "net exporter" countries. We then update the national net exports and redefine the net importer and net exporter countries.

The second step is to adjust the net exporter countries (net exports > 0). The goal is to meet the world total industrial roundwood net exports by adjusting the net exports in the three groups of countries and to adjust the PS waste ratio in Groups 2 and 3 by adjusting the (production – net exports). We assume that Group 3's net exports should not increase because they already have a wood deficit. Therefore, to adjust the PS waste ratio, we only change their production. Group 1's PS waste ratio should not change; therefore, Group 1's net exports and production will increase at the same quantity. (Production – net exports) of Group 2 will be reduced, so net exports must increase, and production may change or may not change. We calculate the total net exports in Groups 1 and 2 and then calculate the net export share among these countries. The shares of net exporter countries are used to increase their net exports and meet the world total industrial roundwood net exports. After that, we adjust the production of the three groups so that their PS waste ratios range from 0.1 to 0.7.

The above procedures create an adjusted FAOSTAT database for the nine-year period of 2006–14 that has reasonable national PS waste ratios and consistent production and consumption numbers. CHARM determines emissions based on the half-lives of wood products. Therefore, we define three major categories: LLPs, which are uses of wood for construction and furniture and other long-term uses; SLPs, which are various paper products; and VSLPs, which are essentially uses of wood for energy (Table 2). The LLP category includes solid wood products such as sawn wood, wood-based

panels, and other industrial roundwood uses (IND-O, about 71 percent of other industrial roundwood). The SLP category consists only of wood pulp, which is directly related to pulpwood or sawlog wood harvests. The VSLP category includes two subcategories: wood fuel (VSLP-WFL) and industrial waste (VSLP-IND). Industrial waste (VSLP-IND) also includes two groups: pulp and sawn waste and other industrial roundwood waste (VSLP-IND-O, about 29 percent of other industrial roundwood). For our 2010 reference, we calculate the national averages for LLPs, SLPs, and VSLPs in cubic meters. Each one has production, net exports, and consumption. They can be converted to dry matter tons by multiplying the global average wood basic density 0.48 tons/m^3.

A.1.2 Projecting Future Demand

Future wood harvests are based on projections of future world wood demand. Wood harvesting has been rising, driven by increased consumption. Wood consumption is highly driven by income and population growth.

For our projection of wood products consumption, we selected sawn wood (SNW), wood-based panels (WBP), paper and paperboard (PPB), and wood fuel (WFL). This is because their consumptions are directly driven by socioeconomic factors and have statistics that can be tracked through trade. (Items such as wood pulp, other industrial roundwood, and industrial waste do not have trade statistics.)

The historical socioeconomic statistics include GDP and population from the World Bank for 1961–2020 (World Bank n.d.a). We use projected growth percentages between 2010 and 2050 for GDP per capita and population. GDP per capita growth is derived from three sources. The first is the ENV-Growth model SSP2 ("middle of the road") by the Organisation for Economic Co-operation and Development (OECD; Dellink et al. 2017); the second is the International Institute for Applied Systems Analysis (IIASA) model SSP2 (Cuaresma et al. 2017); and the last one is based on recent historical (between 1991 and 2010) trend line linear extrapolation, hereafter called LINE. The projections from OECD and IIASA are in constant 2005$ and can be converted to match the World Bank unit in constant 2010$ with an inflation rate of 1.12.[24] Population is based on the UN projection under the medium-fertility variant scenario. All the future projections are divided by their own 2010 estimates (not the same as the World Bank 2010 reference) to obtain the growth percentages.

A preliminary regression analysis shows that industrial roundwood consumption generally has significant positive relationships with GDP per capita. However, wood consumption varies with socioeconomic factors (e.g., demographics, income levels, technology) and also varies significantly between countries, apparently influenced by the availability of wood. For example, countries such as Sweden and the United States, which have abundant forests, use far more wood than Spain and Romania, which have few forests. We therefore used a fixed effects (FE) model (Wooldridge 2001) and reported the projections of wood demand for each country, each product category, and each scenario from 2015 to 2050. Trend lines of wood consumption implicitly factor in relationships between demand and supply because all of those demand and supply interactions were occurring in the past. The FE model applies the same relationship of wood consumption to each country's per capita income growth but starts with each country's initial wood consumption. The FE model helps represent the persistent differences that are caused by the specific properties in the countries and are not related to the GDP per capita, such as the total area of natural forest. Extrapolating the trend lines to the future has the disadvantage of assuming the future will be the same as the past and ignoring lots of other factors that might change demand for any one type of product. However, this is the best guess because the past relationships (parameters) between wood demand and its drivers are not clearly known, and even if they were, these relationships can also change in the future.

Although wood consumption has a generally positive relationship with GDP per capita, some high-income countries, such as Australia, Canada, Japan, and the United States, saw decreases in their historical per capita consumption of sawn wood, wood-based panels, and paper and paperboard consumption as their GDP per capita grew beyond certain levels. We therefore separated the countries into developed and developing countries to avoid overestimating future wood consumption in high-income countries. We used a threshold of US$40,000 for sawnwood and wood-based panels, and a threshold of US$12,000 for paper, paperboard, and fuelwood. We choose $12,000 for paper and paperboard and wood fuel because the threshold for high-income countries is $12,615 by the UN definition. For sawn wood and wood-based panels, we found that $40,000 is a better threshold for model fitting to group the responses of wood consumption to GDP and population.

In each FE regression model, we have dependent variable wood consumption and multiple predictor variables. We use two types of formulas: one only depending on the GDP and population, and the other one including the effect of development and policy change after 2000. We select the year 2000 because the transitions of wood consumption growth in many countries occur around 2000, when the internet usage boom started and modified paper needs. The wood consumption is log transformed (natural), and two predictor variables, GDP per capita and population, are log transformed.

$$\log(W_{it}) = \alpha_i + \beta_1 \log(G_{it}) + \beta_2 \log(P_{it})$$

$$\log(W_{it}) = \alpha_i + \beta_1 \log(G_{it}) + \beta_2 \log(P_{it}) + \beta_3 Y_t^n + \beta_4 Y_t^s$$

W is the wood consumption per capita of each product type (tons per capita), and G is GDP per capita (US$ per capita). The index i refers to the country, and t refers to a data point in time, meaning year = 1961, ..., 2017 in this study. The expression α_i, $i = 1, ..., n$, can be understood as the unobserved time-invariant heterogeneities across the countries $i=1, ..., n$. These individual specific intercepts are considered the fixed effects of countries. Y_t^n is the number of years since 1961, and Y_t^s is the number of years after a shifting technology takes place. Holding the variables related to time trends constant, the ratio of wood consumption between two countries (W_1/W_2) equals the ratio of GDP per capita (G_1/G_2) to the power of

β_1, multiplying the ratio of population (P_1/P_2) to the power of β_2. It tells us that if the ratios of GDP per capita and population remain the same, the ratio of wood consumption stays the same too. Otherwise, the combined effects of GDP per capita and population on wood consumption are no longer linear. The variables related to years are not log transformed because they have zero values. We can say that for a one-year increase in the number of years since 1961, it is expected to see $(\exp(\beta_3)-1)$ increase in wood consumption.

In summary, we establish 12 relationships ("models") based on three different types of wood products, two different trend lines in developed and developing countries, and two different regression formulas. The FE model parameters β_1, β_2, β_3, and β_4 and goodness of fit are estimated by the ordinary least squares regression model with $n - 1$ dummy regressors using the R packages "lm" and "lfe." We obtained an output of a global slope for each model and individual α_i for each country i. All the models have high R^2 full (> 0.88) and significant P values (< 0.05) and have a residual standard error (RSE) between 0.32 and 0.84 (Table A2). R^2 full is the typical R^2 between all pairs of FE-predicted values and original values. For the FE model, another goodness of fit R^2 projection is also considered, which means how much of the variation in the dependent variable for each country is captured by the model. R^2 projection is expected to be small. Paper and paperboard per capita has the highest R^2 projection, and wood fuel per capita has the lowest R^2 projection, which means the time trend cannot explain the variations of wood fuel very well. The FE models have good predicting power in developed countries for sawn wood, wood-based panels, and paper and paperboard and in developing countries for wood fuel (RSE < 0.4).

Table A2 | FE Model Statistics

MODEL	COUNTRY GROUP	COUNTRY NUMBER	R^2 FULL	R^2 FULL ADJ	R^2 PROJ	R^2 PROJ ADJ	RSE
log(SNW_WBP) ~ log(GDP_pcap) + log(POP) + NYEAR + NYEARS	GDP per cap > $40,000	29	0.98	0.98	0.33	0.31	0.32
	GDP per cap < $40,000	166	0.88	0.88	0.28	0.26	0.83
log(PPB) ~ log(GDP_pcap) + log(POP) + NYEAR + NYEARS	GDP per cap > $12,000	67	0.98	0.98	0.65	0.64	0.39
	GDP per cap < $12,000	121	0.92	0.92	0.57	0.56	0.82
log(WFL) ~ log(GDP_pcap) + log(POP) + NYEAR + NYEARS	GDP per cap > $12,000	64	0.95	0.95	0.10	0.08	0.65
	GDP per cap < $12,000	119	0.98	0.98	0.19	0.17	0.40
log(SNW_WBP) ~ log(GDP_pcap) + log(POP)	GDP per cap > $40,000	29	0.98	0.98	0.28	0.26	0.33
	GDP per cap < $40,000	166	0.88	0.88	0.27	0.25	0.84
log(PPB) ~ log(GDP_pcap) + log(POP)	GDP per cap > $12,000	67	0.98	0.98	0.63	0.62	0.40
	GDP per cap < $12,000	121	0.92	0.92	0.57	0.56	0.83
log(WFL) ~ log(GDP_pcap) + log(POP)	GDP per cap > $12,000	64	0.95	0.94	0.04	0.02	0.68
	GDP per cap < $12,000	119	0.98	0.98	0.18	0.17	0.40

Notes: adj = adjusted; GDP = gross domestic product; proj = projection; RSE = residual standard error.

Source: Authors' calculations.

We interpreted these as indicative relationships. In theory, the quantity of wood use could drive GDP growth rather than the other way around, but because wood consumption is a small part of overall GDP growth, that is unlikely. And even if both wood use and per capita income were driven by a third, unknown factor related to both, per capita income growth could still be a good predictor of future wood use.

Based on the coefficients for the models with the time effect, we can derive the wood consumption in the 2010 reference year and the 2050 projected year as follows:

$$\log(W_{i,t=2010}) = \alpha_i + \beta_1 \log(G_{i,t=2010}) + \beta_2 \log(P_{i,t=2010}) + \beta_3(2010-1961) + \beta_4(2010-2000)$$

$$\log(W_{i,t=2050}) = \alpha_i + \beta_1 \log(G_{i,t=2050}) + \beta_2 \log(P_{i,t=2050}) + \beta_3(2050-1961) + \beta_4(2050-2000)$$

Subtracting wood consumption in 2010 from 2050 leads to

$$\log\left(\frac{W_{i,t=2050}}{W_{i,t=2010}}\right) = \beta_1 \log\left(\frac{G_{i,t=2050}}{G_{i,t=2010}}\right) = \beta_2 \log\left(\frac{P_{i,t=2050}}{P_{i,t=2010}}\right) + (\beta_3 + \beta_4)(2010-2000)$$

$W_{i,t=2010}$ is the 2010 reference wood consumption, which is the 2006–2014 average of the annual wood consumption. $\frac{G_{i,t=2050}}{G_{i,t=2010}}$ is the ratio of GDP per capita between 2050 and 2010, and $\frac{P_{i,t=2050}}{P_{i,t=2010}}$ is the ratio of population between 2050 and 2010 from the United Nations. The 2050 wood consumption in each country is derived from the above formula for three GDP per capita projection models (OECD, IIASA, and LINE) and for two regions (developed and developing). Similarly, the 2050 wood consumption for the models excluding time effect can be derived as this simplified formula:

$$\log\left(\frac{W_{i,t=2050}}{W_{i,t=2010}}\right) = \beta_1 \log\left(\frac{G_{i,t=2050}}{G_{i,t=2010}}\right) + \beta_2 \log\left(\frac{P_{i,t=2050}}{P_{i,t=2010}}\right) = \log\left(\left(\frac{G_{i,t=2050}}{G_{i,t=2010}}\right)^{\beta_1}\left(\frac{P_{i,t=2050}}{P_{i,t=2010}}\right)^{\beta_2}\right)$$

GDP per capita from the complex model projections are dramatically high in developing countries, and the GDP per capita from the simple linear model may be too low in developed countries. To avoid the unrealistic overestimation of future wood consumption, we first apply a cap to the developing countries' wood consumption per capita using the 75th percentile of the developed countries' wood consumption per capita in 2050. After capping the developing countries, we further filter the unlikely high wood consumption per capita that has more than a 10-fold increase between 2010 and 2050. Then we obtain the intermediate prediction by applying equal weights to the results based on complex models (OECD/IIASA) and recent linear extrapolation (LINE). In other words, the weights for OECD, IIASA, and LINE are 0.25, 0.25, and 0.5, respectively.

Considering the combination of matching FAOSTAT recent trends and higher R^2, for sawn wood and wood-based panels, we selected the regression formula with the time effect for developed regions and without the time effect for developing regions; for paper and paperboard, we selected the regression formula with the time effect for both regions. For wood fuel, we calculate the average between the two formulas in developing countries. In developed countries, we use the formula excluding time effect for wood fuel because the recent increasing trend in wood fuel is related to short-term policy and should not be built into the model for long-term projection. Finally, we obtain the average national growth percentages from 2010 to 2050 for the three wood products.

A.1.3 Estimating Future Production

We apply the growth percentages of sawn wood and wood-based panels, paper and paperboard, and wood fuel to consumption of LLPs-M (main), SLPs (wood pulp), and VSLPs-WFL. We keep the LLPs-O (other) unchanged between 2010 and 2050 because there are no available trade statistics for other industrial roundwood and we cannot assume LLPs-O grow at the same rate as LLPs-M. Note that this can underestimate the real wood demand. We keep wood pulp growing at the similar rate as paper and paperboard, assuming that the ration of wood pulp to paper remains unchanged between 2010 and 2050.

The results of this FE model are the consumption of each wood product category in 2050. However, the inputs for CHARM are the amount of wood production. To predict the production in 2050 for CHARM inputs, we assume the trade balances in 2050 are the same as the 2010 reference. We first split the countries in 2010 into net importers (net imports < 0) and net exporters (net exports > 0). For net importers, we calculate the import percentages (net imports/consumption) and apply these percentages to the 2050 consumption to get 2050 net exports. For example, if a country imports 20 percent of its wood in 2010, the model assumes it will do so in 2050. After that, we calculate the 2050 world total net exports (= sum of world total net imports). For net exporters, we calculate the 2010 export shares of global exports (net exports/world total net exports) for each country. We adjust the 2050 net exports of these countries in response to match the 2050 world total net exports in proportion to their share of global exports. Finally, we derive the 2050 production using 2050 consumption and 2050 net exports for both net importers and net exporters.

For other industrial roundwood, LLP-O and VSLP-IND-O 2050 production remains the same as 2010 production. To estimate industrial wood waste (VSLP-IND-M) production in 2050, we calculate the ratio of VSLP-IND-M to IND-M. Then we calculate the difference of IND-M 2050 and IND-M 2010, and then apply the ratio to this difference and get the additional waste (VSLP-IND-M 2050 – VSLP-IND-M 2010). At the end, we get the total VSLP-IND 2050 production by adding up VSLP-IND-M 2050 and VSLP-IND-O 2050. We then sort the country-level results by 2010 production from greatest to least and use the top 20 percent of countries across the three product categories. This gives us a list of 30 countries that accounted for 80 percent of global wood production in 2010.

A.1.4 Conceptual explanation of land-use calculation

The land area requirements for the model are calculated at the national and global levels. Demand for different types of wood products per year is provided as an input, converted into roundwood equivalents, and then used to estimate wood harvest. Wood is supplied from one of two sources, plantation forests

and secondary forests, each with its own efficiencies of wood harvested. Wood supply from plantation forests is used first, with remaining forest supplied by secondary forests.

To estimate wood supplied by secondary forests, the forest types in each country are characterized by their aboveground growth rates, areas, and some other characteristics, and a composite national-level forest type is created by the weighted average of the secondary forests. (The result is mathematically equivalent to allocating wood harvests to each separate forest type based on its percentage area.) Wood supply from each hectare is provided by this national-average forest based on the percentage of aboveground wood harvested that makes it into a product pool while the remainder is left as slash. Although slash rates can be altered in the model, in our scenarios presently used, slash rates for developed countries are based on U.S. calculations of average slash rates for nonplantation forests, and for tropical countries, slash rates are based on estimated average slash rates by Ellis et al. (2019).

Natural forest carbon stocks at time of harvest can be varied. For our present scenarios, we assume that only secondary forests will be harvested, and they are harvested at least after 40 years or 20 years growth after reaching the national average aboveground carbon stock.

For plantation forests, initial wood supply in 2010 is based on the area of planted forest estimated by the FAO divided by the estimated average rotation length. For example, if the rotation length is 10 years, then a 10th of the plantation forest is estimated to be available in 2010 and in subsequent years. Plantation slash rates are established separately. Plantation forests can also be thinned, with some of the wood harvested in this way available for SLPs or VSLPs.

Different scenarios allow plantation areas to evolve over time according to different rules. For example, in one scenario, new plantations come from agricultural land. In another, secondary forests are converted to plantation forests as secondary forests are harvested. Because plantation forests need to grow before they can supply wood, the supply from plantation forests can be constrained. The model estimates the potential supply of wood from plantation forests each year between 2010 and 2050 and allocates the remainder of the supply to secondary forests. Model results for each country include the total area of plantation forests that will be established in 2050 and the total hectares of harvests of secondary forests that must occur between 2010 and 2050 to meet wood product demands.

Wood demand and supply is estimated for the world's top 30 wood-producing countries because of the higher quality of data available for those countries. Together, these countries made up around 80 percent of the world's wood production in 2010. For the global calculations, the full 100 percent wood demand is allocated to these 30 countries. Supply is met from within the country based on its share of demand produced internally, and imports are met proportionately by exporting countries. We divide the areas by 0.8 to generate global estimates, which assumes that the remaining 20 percent would be met with a harvest efficiency equal to the average of the other 80 percent.

A.1.5 Mathematical description of land area calculation

For each scenario, we calculate the total number of hectares required for harvesting every year from 2010 to 2050. To do this, we first calculate the total amount of each product required every year in each product pool (LLP, SLP, VSLP) using the formula below:

For each product pool *j* in year *i*,

$$T_{i,j} = T_{i,j-1} + r$$

where *i* is the year in the range of 2011–50, *T* is the tons of dry matter of a product type *j* produced in year *i* (the dry matter in product pool j in the year 2010 is calculated based on the ratio of LLP:SLP:VSLP in the 2010 baseline), and *r* is the annual proportion of increased demand calculated as

$$r = \frac{T_{2050} - T_{2010}}{2050 - 2010}$$

We then convert the total tons of dry matter in all product pools into tons of carbon based on the assumption that dry matter is 50 percent carbon.

We assume that there is a maximum number of plantation hectares that may be harvested such that all hectares are harvested over the course of a single rotation period. For example, if a country has an average rotation period of 10 years, every hectare may be harvested four times over 40 years, and no more than 10 percent of managed forests may be harvested each year.

For countries where there is a large area of plantation forest, and supply for a given year is less than the maximum production capacity from plantation hectares, the number of hectares harvested is scaled down accordingly to eliminate any surplus. For example, if a country with a rotation period of 10 years can harvest up to 100 ha every year with a capacity of 1,000 tC in products per year, but the supply needed in a certain year is only 900 tC, then the model would only simulate the harvest of 90 ha. If the supply needed is 1,100 tC, then 100 ha of plantation would be harvested, and the rest of the wood would come from secondary forests.

After calculating the amount of wood supplied from plantation forests in a given year, we determine the number of secondary forest hectares required if all supply is not met from the first or subsequent harvest of plantations:

$$area = \frac{T_C}{\mathrm{AGB}}$$

where *AGB* is the amount of aboveground biomass that makes it into a product pool in units of tons of carbon per hectare of secondary forest, and T_C is the remaining amount of carbon required that is not supplied by plantation forests.

The sum of the area required every year from 2010 to 2050 is the total area harvested in the period of analysis.

A.1.6 Conceptual description of carbon calculation

The carbon implications of forest harvests are based on a comparison of two scenarios: a "harvest" scenario, which measures the total carbon stocks in various carbon pools, and a "nonharvest" scenario, which measures the carbon stocks in the unharvested forest, also known as a counterfactual. For unharvested forests, the carbon stock includes all live vegetation carbon, which varies by age. If a secondary forest is not harvested, it will continue to grow up to a maximum carbon density. If a forest is harvested, the carbon that was live is allocated each year to different pools, such as residues and roots left in the forest and wood used for the three product types (LLP, SLP, and VSLP). Carbon in most pools declines over time, some decaying directly into the air, some being burned for energy, and some being put into landfills, from which further decay occurs either as carbon dioxide or as methane. The allocation of wood to different pools and decay rates are established as model inputs and can vary by forest type. For the live vegetation pool, because clear-cuts are assumed, the pool is eliminated in the first year of harvest. But this pool regrows over time according to growth rates specified for that forest type in each country. Table A3 describes the pools.

Our model assumes that all VSLPs are burned as they "decay," all SLPs are burned after use, and LLPs go to landfills as they decay. Burned biomass is counted as an immediate emission. Meanwhile, the landfill pool can be interpreted as temporary storage because the carbon in the wood products is not immediately released into the atmosphere. However, some percentage of the carbon emitted from the landfill is converted to methane, which has a much higher global warming potential (GWP). Thus, when we calculate the total carbon "benefit" of a harvest in any given year based on the amount of carbon stored across all of the pools, we subtract the additional climate impact of methane converted into CO_2e using a GWP of 34.

Table A3 | Description of Carbon Pools in CHARM

POOL	HALF-LIFE (YEARS)	DESCRIPTION
Stand	N/A	Live aboveground and belowground biomass in the forest
Slash	18[a]	Dead biomass that is left following a harvest
Dead roots	5.2[b]	Decaying roots from trees that have been harvested
VSLP	N/A	Very short-lived products (biomass burned for energy immediately)
SLP	2.5[c]	Short-lived products (paper products)
LLP	13–47[d]	Long-lived products (timber used for furniture or construction). LLPs are subdivided into wood used for furniture and wood used for construction because of their different storage lives
Landfill	29[e]	Temporary storage of LLPs that are disposed of at the end of life
Fossil carbon		Changes in fossil carbon due to the use of wood as a substitute for alternative products

Note: N/A = not applicable.

Sources: a. Russell et al. 2014; b. Brunner and Godbold 2007; Zhang and Wang 2015; c, d. Pingoud et al. 2006; e. Skog 2008.

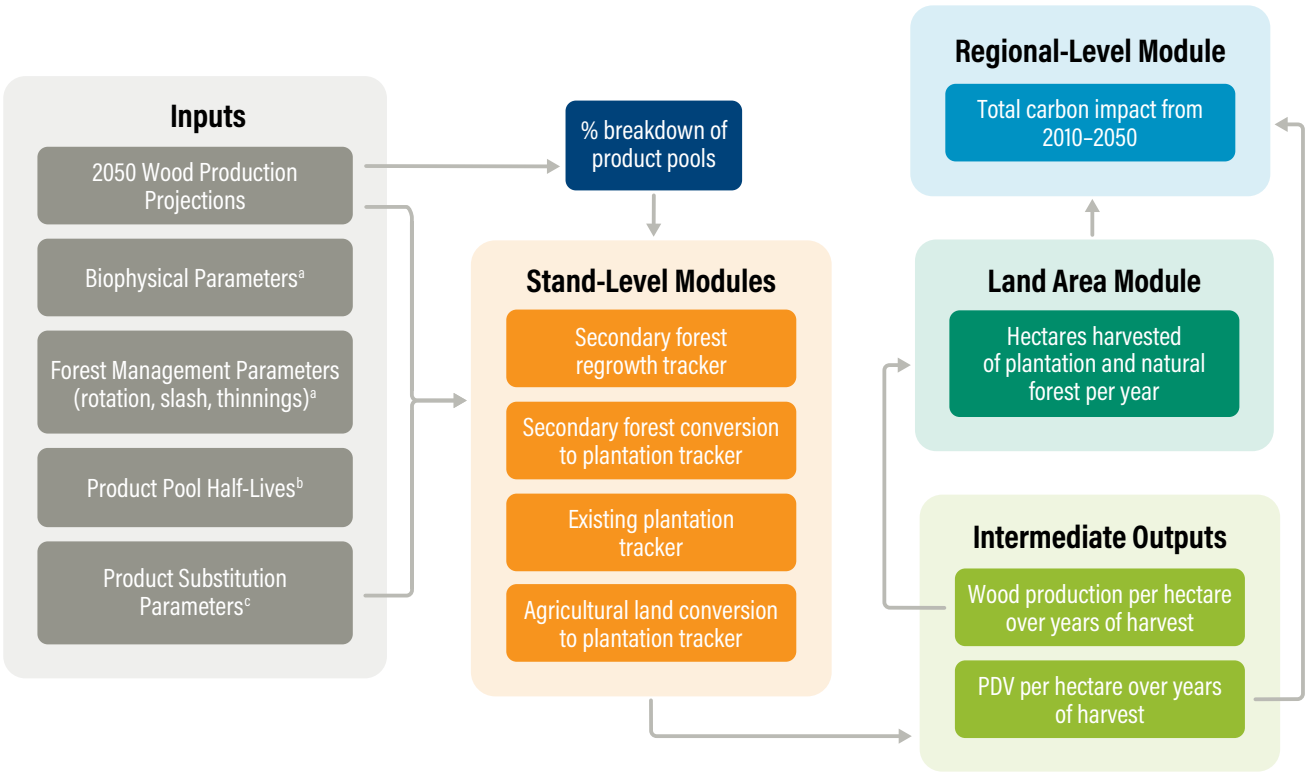
One pool that can be implicitly counted by the model is a pool of underground carbon stored in fossil fuels that is affected by the harvest. Fossil fuels are used in growing, harvesting, and processing wood products. Although these are real emissions, the model does not count them by themselves. However, the model can be run with a "substitution value," which estimates the amount of carbon emissions avoided from the use of wood to replace conventional construction products, such as concrete and steel. When run with substitution values, the model implicitly counts both the production emissions from the wood product and the production emissions of the LLPs.

The use of VSLPs also potentially saves fossil emissions, but the production of both VSLPs and SLPs generates emissions. The model is set up to calculate the net effects on fossil emissions use. Because of numerous data uncertainties about how much wood is ultimately burned for energy used outside of the wood products industry, how much is used for wood products, and how much fossil energy is used in generating pulp and paper products, the present model runs consider these effects to cancel each other out. These runs therefore do not count bioenergy savings but also do not count fossil emissions used to produce any product other than LLPs and the materials for which they substitute.

Substitution values do not mean that the forest harvest produces fewer emissions. Those forestry-related emissions are still real. But the model can calculate a net effect of forest harvests for LLPs compared to the use of conventional construction materials. Users must input the percentage of LLPs that make it into construction and the percentage of that quantity that displaces the conventional construction materials.

One feature of the model is that it calculates a present discount value of the changes in carbon each year. The present discount value is calculated to the year of harvest, whenever that occurs. The choice of a discount rate is a policy decision, which can represent two benefits of earlier mitigation. One of these benefits is in service of the goals of avoiding immediate and permanent damages from rising temperature (e.g., the effects of ice sheet melting or biodiversity loss) and reducing the risk of crossing a variety of climate thresholds. Earlier mitigation in effect increases the time people can improve technology and organize the political will and resources to combat climate change (Daniel et al. 2019). The other benefit of earlier mitigation results from the time value of money. Our approach follows the discounting employed in Searchinger, Wirsenius, et al. (2018) and is designed to be a rigorous way of reflecting current global policies that seek to reduce emissions greatly or even to net zero by 2050. The precise discounting formula is described in Section A.1.8. CHARM's structure is summarized in Figure A1.

Figure A1 | CHARM Structure



Note: PDV = present discount value.

Sources: a. Harris et al. 2021; b. various sources; c. Leskinen et al. 2018.

A.1.7 Description of the counterfactual

For each wood supply scenario, we estimate the required land area and carbon costs (PDV per hectare) for the plantation and the secondary forest area harvested. The carbon costs are determined by the planting/harvesting action (harvest scenario) and the alternative action (nonharvest scenario). Table A4 shows the main harvest scenarios and corresponding nonharvest scenarios:

- Allowing for a secondary forest regrowth after an initial harvest
- Converting a secondary forest into a plantation
- Harvesting an existing plantation
- Converting agricultural land into a plantation

For Scenarios 2–4, the land is growing as a plantation and being harvested after each rotation cycle. In Scenario 3, we assume that the nonharvest scenario is a secondary forest that is the same age as the plantation's rotation period because that focuses the alternative at the time of the last harvest.

A plantation forest either can grow at a young growth rate for the first 20 years and at an old growth rate after 20 years or at one plantation growth rate throughout the rotation period.
A secondary forest typically grows at a Monod function of forest age (McMahon et al. 2010):

$$C\,(Age) = \frac{AGB_{max} * Age}{Age + Age_{50\%}}$$

The parameters AGB_{max} and $AGB_{50\%}$ are derived from Harris et al. (2021) and Bernal et al. (2018). The initial carbon stock for forests being harvested depends on the age of harvest. The harvesting age is at least 40 years, or 20 years growth after the average aboveground carbon stock from the Harris et al. (2021) data set.

Table A4 | Estimating carbon costs under four different scenarios

	SCENARIO	INITIAL CONDITION	GROWTH FUNCTION
(1) Allowing a secondary forest regrowth after harvest	Harvest scenario	Monod function at the age of harvest	Harvested once and grows at Monod function
	Nonharvest scenario	Monod function at the age of harvest	Continue growing at Monod function
(2) Converting a secondary forest into a plantation	Harvest scenario	Monod function at the age of harvest	Harvested after each rotation cycle and grows at plantation growth rate
	Nonharvest scenario	Monod function at the age of harvest	Continue growing at Monod function
(3) Harvesting an existing plantation	Harvest scenario	Plantation carbon stock after one rotation cycle	Harvested after each rotation cycle and grows at plantation growth rate
	Nonharvest scenario	Monod function at the age of one plantation rotation cycle	Continue growing at Monod function
(4) Converting agricultural land into a plantation	Harvest scenario	Zero carbon stock	Harvested after each rotation cycle and grows at plantation growth rate
	Nonharvest scenario	Zero carbon stock	Grows at Monod function

Source: Carbon Harvest Model.

A.1.8 Mathematical description of the carbon calculation

The model calculates a PDV for the harvest of single hectares of secondary and plantation forests (separately) over the period of 40 years from the year of harvest at a discounted rate of 4 percent. To calculate the PDV, we start by calculating the annual carbon "benefit," which is the sum of all carbon stored in all pools, the regrowth on the stand minus any emissions of methane that occur in the landfill. For calculations with substitution values, we include the changes in both fossil fuels and other production emissions from using wood for construction or traditional bioenergy rather than using concrete and steel or propane gas for traditional bioenergy.

Next, for each year, we calculate the difference between the total annual benefit and the carbon "cost," which is the counterfactual stand carbon density in that year. We then calculate the difference in this value relative to the previous year. This value, shown below as $\Delta C_{change,}$ is what we discount. The PDV for the harvest of a single hectare in the year 2010 is therefore calculated as

$$PDV = \sum_{i=0}^{t} \frac{\Delta C_{change,i}}{(1+r)^{i}}$$

where *i* is the number of years since 2010, *r* is the discount rate (4 percent), and *t* is 40 years.

This is done separately for both plantations and secondary forests. For national and global results, we then multiply each PDV by the number of hectares required of each forest type in the year harvested.

The total PDV is the sum across all years of the PDV for secondary and plantation forests in each year multiplied by the area of each forest type harvested in that same year:

$$PDV_{total} = \sum_{h=2010}^{K} PDV_{secondary,h} \times a_{secondary,h} + \sum_{h=2010}^{K} PDV_{secondary,h} \times a_{secondary,h}$$

where *h* represents the year of harvest that starts from 2010, *K* represents the number of years for harvests (for example, 40 years), *a* represents the new area of one forest type harvested in year *h*. The next subsection describes the calculation of area required for each forest type.

A.1.9 Brief comparison with alternative accounting approaches

The carbon accounting approach used in this model follows the approach originated by Schlamadinger and Marland (1996) and used by numerous models since then, including those in Chen et al. (2018) and Smyth et al. (2020) as well as in papers specifically analyzing forest-based bioenergy (Bernier and Paré 2013; Booth 2018; Holtsmark 2012, 2013; Hudiburg et al. 2011; Laganière et al. 2017; Manomet Center for Conservation Sciences 2010; McKechnie et al. 2011; Mitchell et al. 2012; Stephenson and MacKay 2014; Zanchi et al. 2012). Accounting for the GHG costs of forestry is presently done using a wide variety of approaches, which are typically presented with little discussion (Ter-Mikaelian et al. 2015).

Some alternative approaches treat wood harvest as "carbon neutral" so long as forests are harvested "sustainably," which means reductions of carbon in the forest are not incorporated into the carbon accounting. In its strongest formulation, sustainable management in this context is used to mean that the harvest of forests does not exceed the annual growth of the forest, so that overall existing carbon stocks are maintained. However, as explained in numerous papers, if forests would gain carbon if not harvested, then the harvest by definition reduces the carbon (EASAC 2018; Haberl et al. 2012; Searchinger et al. 2009; Ter-Mikaelian et al. 2015). Put another way, the effect of a harvest in one area is not altered by changes in forests anywhere else that would occur anyway. Among other effects, this carbon neutrality approach treats the elimination of the forest carbon sink (due to increased carbon dioxide) through wood harvesting as having no climate consequence even though that sink is critical to restraining climate change (Schimel et al. 2015; Searchinger, Wirsenius, et al. 2018).

In our biophysical model, CHARM, the offsetting benefits of forest harvesting result from storage of carbon in forest products and the forest regrowth that occurs after a harvest; they can also include substitution benefits with alternative products. Unharvested forests also continue to grow, but their growth in carbon eventually slows down. As a result, regrowth will eventually have higher growth and therefore carbon sequestration rates, and the net increase in growth rates provides benefits. The net changes in all carbon pools each year, including carbon in regrowing forests, are then valued based on their present discount value dated to the year of harvest in order to compare the flows of carbon from different harvest or nonharvest scenarios and to reflect the general public policy goal of seeking rapid reductions in emissions between today and 2050.

There is a debate about whether increasing wood demand, through market signals, results in changes in land-use behavior that should be incorporated into modeling. For example, increased market demand driven by policy for additional wood for construction could cause some landowners to intensify their forest management, such as shifting from secondary forests to plantations. Alternatives might include converting some agricultural land to forest or diverting wood harvests from SLPs to LLPs. These are potential uses affected by increases in wood prices. Such analyses are econometrically challenging, and if they are going to reflect economic responses, they must also include such other possible responses to changing prices as the expansion of agriculture into forests in other areas to maintain agricultural production, the reduction in other uses of wood for LLPs, and offsetting increases in steel and concrete production for other uses.

By itself, CHARM is agnostic about whether increased demand for wood causes cascading changes in supply. Instead, CHARM analyzes the carbon consequences of aggregate specified levels

of supply and demand. For example, if a policy is expected to drive more conversion of secondary forest to plantations, or to establish plantations on existing agricultural land on a net basis, CHARM can analyze the carbon implications of such changes. Some of our scenarios evaluate changes in wood supply sources that, in theory, could result from economic feedback effects or other policy changes.

A.2 Model Inputs

A.2.1 Biophysical forest inputs

Colleagues at WRI developed a model that generates regional biophysical forest data described in Harris et al. (2021). The resulting data set provides many parameters, some of which are integral to our analysis. For any given country and ecozone (tropical, temperate, etc.), the model provides the forest type (primary, young secondary, old secondary, or plantation), area, aboveground carbon stock across the entire area, aboveground carbon density per hectare, and annual growth rate per hectare.

Our model requires separate biophysical inputs for secondary forests and managed forests (plantations). For both forest types, we create an "average forest," which includes the growth rate as an average across all ecozones weighted by area. We used the weighted average of "wood fiber" type for plantation and used the average growth rate.

For secondary forest growth rates, Harris et al. (2021) provides two growth rates: less than 20 years of age (GR1) and greater than 20 years of age (GR2). We used the estimates and adjusted them based on the following rules. If the ratio of GR2 to GR1 is large, above 85 percent, or even if GR2 is larger than GR1, we utilized another data set's GR2 and GR1 ratio and calculated the average GR2/GR1 between the two data sets (Bernal et al. 2018; see Table A8).

We used the Monod function to simulate the higher growth rates in the younger forests and lower growth rates in the older forests (McMahon et al. 2010; Poorter et al. 2016). Because we are discounting growth by time, higher growth rates for younger forests (versus older forests) matter to our calculations. For growth rates beyond 20 years, the data set includes very old secondary forests with slow growth rates because this categorization served the purposes of the study by Harris et al. (2021).

Although most biophysical forest inputs come from Harris et al. (2021), we consulted external sources for a select few countries for plantations whose parameters had a great impact on the overall results and for which there was conflicting evidence about average growth rates. Particularly, we sought alternative plantation growth rates for Brazil, China, Mexico, Indonesia, and the United States.

Plantation Growth Rates in the United States

For U.S. plantation growth rates, Harris et al. (2021) used an analysis prepared by Richard Birdsey based on growth rates for artificial regeneration without disturbance plantations using national forestry inventory data compiled by the U.S. Forest Service. These data sources resulted in an estimate of 3.85 tC ha-1 yr-1 of above-ground carbon gains as a weighted average of different plantation types. However, these growth rates were substantially higher for key plantation types presented from the same data source for all loblolly and other plantation types in the southeastern United States in the 2017 Forest Resources Assessment (Oswalt et al. 2019). The Southeast is the region that supplies the great majority of plantation wood in the United States. The area of plantations in that publication generally matched the data for plantations used from FAO. The difference in growth rates from the same data sources likely represents a difference in quality of plantation analyzed. Because the model uses a larger plantation area definition, a modified plantation growth rate was needed to accurately represent average growth rates.

They were also substantially higher than the carbon accumulation rates of high productivity stands of the four most widespread plantation types in a U.S. Forest Service Publication (Hoover et al. 2021). For the three most prevalent planted forest types, which comprise 82% of the total U.S. planted forest area as estimated by Harris et al. (2021), we found a 42% difference between estimates from the Birdsey analysis and those for high productivity sites in Hoover et al. (2021). We chose to average the results and accordingly reduced the Harris et al. (2021) estimated growth rate for all plantations by 21%, yielding an average plantation growth rate of 3.05 tC/ha/yr in above-ground carbon.

Plantation growth rates in Brazil

As in the United States, literature values for plantation growth rates vary and tend to emphasize higher values. IBA, the association of the Brazilian Tree Industry, provides annual reports with information on planted forest area by type and consumption of wood by facilities that harvest this wood. Our estimate of growth rates per hectare uses 2012 information on planted forest area, separately provided for eucalyptus, pine and other, and 2016 information on quantities of wood consumed. Planted area in 2012 is provided in the 2014 report, and quantities consumed is provided in the 2022 report. We used this lag to recognize that because Brazil's area of planted forest is growing, some of the planted forests in 2012 would be newly planted and would not be generating harvests in 2012. Because the wood consumed is only the wood harvested, we also used a biomass expansion factor (BEF) to estimate total above ground carbon. In Brazil, the great majority of plantation forest wood is used for pulp or charcoal, allowing highly efficient uses of above-ground carbon reported at 88% by Greenwood Resources, a major owner and operator of Brazilian forest plantations, which gives an inverted BEF of 1.14, which we applied both to eucalyptus and pine, while using a higher BEF of 1.35 for other. The final calculation results in an estimate of 8.22 tC/ha/yr above-ground forest gains.

Plantation growth rates in China

For growth rates in China, we collected statistics from the literature based on the National Forest Inventories. We gathered the annual volume increment ($m^3\ ha^{-1}\ yr^{-1}$; Liu et al. 2019), area (ha; State Forestry and Grassland Administration 2022), biomass expansion factor, and wood basic density ($t\ m^{-3}$; Zeng 2017) for different species and then aggregated them to the average national growth rate of 1.27 tC/ha/yr of existing plantation.

Plantation growth rates in Mexico

Similarly, for growth rates in Mexico, we used the annual volume increment, wood density, and area from the report of the Mexican National Forestry Commission (CONAFOR 2012). We aggregated the growth rate for major plantation species to the national average plantation growth rate at 3.60 tC/ha/yr.

Summary of biophysical forest parameters

The data set from Harris et al. (2021) also included the areas of plantation forests. However, we found some inconsistencies. For example, some countries had no reported hectares of plantation forest. To overcome this issue and maintain consistency, we instead used the area of managed forest provided by FAO Global Forest Resources Assessment (FRA) for the relevant countries. Table A5 lists the growth rates and plantation area for the 30 countries.

A.2.2 Harvest inputs

The model also requires information on management decisions and harvest efficiency. The model requires the proportion of wood from a harvest or thinning that makes it into each product pool, how much AGB is left as slash after a harvest, and the proportion

Table A5 | Biophysical Parameters and Area Used for the Global Analysis

COUNTRY	YOUNG SECONDARY GR1 ($tC\ HA^{-1}\ YR^{-1}$)	MIDDLE-AGED SECONDARY GR2 ($tC\ HA^{-1}\ YR^{-1}$)	AVERAGE SECONDARY CARBON STOCK (MgC/ha)	EXISTING PLANTATION GR ($tC\ HA^{-1}\ YR^{-1}$)	FAO PLANTATION AREA (ha)
Australia	1.53	1.4	59.55	4.64	1,903,000
Austria	1.74	1.23	66.28	1.53	1,696,000
Bangladesh	3.43	1.14	88.61	2.74	237,000
Brazil	3.68	1.07	52.38	8.22	6,973,000
Canada	0.92	0.76	31.43	0.84	13,975,000
Chile	3.06	1.91	57.35	5.48	2,384,000
China	2.25	0.73	62.22	1.27	73,066,500
D. R. Congo	4.42	1.65	57.97	7.97	58,779
Ethiopia	2.75	0.79	61.97	5.82	511,000
Finland	0.89	0.61	27.77	0.86	6,775,401
France	1.83	1.3	79.99	1.73	2,086,000
Germany	1.68	1.26	81.32	1.73	5,290,000
Ghana	5.04	1.56	60.66	5.04	260,000
India	2.78	1.89	97.4	1.73	11,139,000
Indonesia	4.33	1.16	86.99	7.21	4,803,000
Japan	1.51	1.31	78.86	1.75	10,292,000
Kenya	3.37	0.75	54.79	3.37	193,000
Mexico	3.24	1.39	49.52	3.6	59,000
Myanmar	3.1	2.53	104.16	2.74	988,000

Table A5 | Biophysical Parameters and Area Used for the Global Analysis (cont.)

COUNTRY	YOUNG SECONDARY GR1 (tC HA^{-1} YR^{-1})	MIDDLE-AGED SECONDARY GR2 (tC HA^{-1} YR^{-1})	AVERAGE SECONDARY CARBON STOCK (MgC/ha)	EXISTING PLANTATION GR (tC HA^{-1} YR^{-1})	FAO PLANTATION AREA (ha)
Nigeria	5.2	1.36	59.72	5.2	328,000
Pakistan	1.3	0.39	81.45	2.74	340,000
Poland	1.8	1.3	54.46	1.81	8,877,000
Russia	1.04	0.72	37.8	0.88	19,612,900
South Africa	1.74	0.81	59.97	3.59	1,763,000
Sweden	1.2	0.84	31.04	1.18	12,564,000
Thailand	3.96	2.04	93.75	3.7	3,986,000
Uganda	3.4	1.35	40.82	3.4	55,000
Tanzania	3.14	1.49	58.52	3.14	240,000
USA	2.11	1.09	61.46	3.05	25,564,000
Vietnam	3.38	2.62	82.34	6.74	3,823,000

Note: GR = growth rate.

Source: Authors' calculations based on FAO (2020) and Harris et al. (2021).

of AGB that is removed during the thinning. For plantation, the slash proportion is the wood that are not for industrial usage. In order to be consistent with our plantation growth rate, we used BEF to estimate the branches and leaves, which results in a slash rate at (BEF – 1)/BEF (see Table A6). For the secondary forest slash rate, the model uses a default value of 20 percent for the VSLP share. For the LLP and SLP share, the model uses a 25 percent for EU and North American countries and a 30 percent for the remaining nontropical countries. In tropical countries, the slash rate is far higher (Ellis et al. 2019). At present, we apply country-specific secondary forest slash rates to 16 tropical forests based on Ellis et al. (2019) and Pearson et al. (2017; see Table A6).

Another key parameter relevant to management is the rotation period for both the harvests and the thinnings. At present, we apply parameters for thinnings to some stand-level analyses but do not apply thinnings to the global scenarios; however, the effects of thinning are implicitly incorporated into estimated growth rates and harvest volumes.

The rotation period is a highly variable parameter that depends on the specific management regime for a given plantation. For a stand-level scenario, users can input a specific rotation period. However, we consulted the literature to find the best estimate for each country for our global analysis (e.g., European Parliament 1997; Natural Resources Institute Finland 2012; Torres-Rojo et al. 2016; UNDP 2013; Directorate General of the State Forests 2017; Hertog et al. 2019; FSIV 2009; Hoover et al. 2021; World Bank 2019.). When the rotation information was not readily available for some countries, we made educated guesses based on the plantation growth rates and the known rotation periods of other countries.

We also apply decay rates for each carbon pool according to Table 12.2 of the 2006 IPCC *Guidelines for National Greenhouse Gas Inventories* (IPCC 2006) described in Table A3. However, these values can be modified for more specific scenarios. Annual emissions are calculated by tracking the decay that occurs in each pool from one year to the next, including methane due to landfilled LLPs, as previously described.

A.2.3 Construction and substitution inputs

CHARM calculates the benefits due to avoided emissions from concrete and steel in construction by estimating the percentage of LLPs in a country that are used for construction and then estimating the quantity of construction material that actually displaces concrete and steel. This value is highly uncertain because the quantity of wood that replaces a given amount of concrete and/or steel varies widely by region and building type. Smyth et al. (2017), for example, compare the emissions of construction materials required for a less-wood-intensive building relative to a similar more-wood-intensive building in Canada in order to estimate the substitution coefficient. Chen et al. (2018) estimate that 64 percent of LLPs used in construction displaces concrete and steel in Canada.

Table A6 | Secondary Forest Slash Rates for Tropical Countries

COUNTRY	SECONDARY FOREST SR (%)	SOURCE	PLANTATION SR (%)	SOURCE
Australia	30	This study	17	BEF = 1.2
Austria	25	This study	13	BEF = 1.15
Bangladesh	79	Ellis et al., Pearson et al.	33	BEF = 1.5
Brazil	65	Ellis et al., Pearson et al.	13	BEF = 1.15[a]
Canada	25	This study	25	Use natural slash rate at high efficiency
Chile	79	Ellis et al., Pearson et al.	22	BEF 1.2 for Pine and 1.5 for Eucalyptus[b]
China	30	This study	19	BEF = 1.15-1.5[b]
D.R. Congo	82	Ellis et al., Pearson et al.	33	BEF = 1.5
Ethiopia	64	Ellis et al., Pearson et al.	33	BEF = 1.5
Finland	25	This study	25	Use natural slash rate at high efficiency
France	25	This study	13	BEF = 1.15
Germany	25	This study	25	Use natural slash rate at high efficiency
Ghana	64	Ellis et al., Pearson et al.	25	Use natural slash rate at high efficiency
India	79	Ellis et al., Pearson et al.	33	BEF = 1.5
Indonesia	79	Ellis et al., Pearson et al.	29	BEF 1.33 for Acacia and 1.5 for Eucalyptus[b]
Japan	30	This study	13	BEF = 1.15
Kenya	64	Ellis et al., Pearson et al.	25	Use natural slash rate at high efficiency
Mexico	71	Ellis et al., Pearson et al.	24	BEF = 1.05-1.5[b]
Myanmar	79	Ellis et al., Pearson et al.	33	BEF = 1.5
Nigeria	64	Ellis et al., Pearson et al.	25	Use natural slash rate at high efficiency
Pakistan	30	This study	33	BEF = 1.5
Poland	25	This study	25	Use natural slash rate at high efficiency
Russia	30	This study	25	Use natural slash rate at high efficiency
South Africa	30	This study	25	Use natural slash rate at high efficiency
Sweden	25	This study	25	Use natural slash rate at high efficiency
Thailand	79	Ellis et al., Pearson et al.	33	BEF = 1.5
Uganda	64	Ellis et al., Pearson et al.	25	Use natural slash rate at high efficiency
Tanzania	64	Ellis et al., Pearson et al.	25	Use natural slash rate at high efficiency
United States	25	This study	10	BEF=1.1-1.15[b]
Vietnam	79	Ellis et al., Pearson et al.	33	BEF = 1.5

Note: SR = slash rate. a. see our discussion on Brazil plantation growth rate; b. the slash rate is a weighted average of main species based on area share

Source: Authors' calculations.

Table A7 | LLP percentage in construction

COUNTRY	% LLP USED IN CONSTRUCTION
United States	45
Japan	67
United Kingdom	14
France	32
Germany	30
China	59
Russia	17
Finland	56
Sweden	50
Canada	51
All other LLP-producing countries	42

Note: LLP = long-lived product.

Source: Authors' calculations.

Zhang et al. (2020) developed a new method for estimating the percentage of LLPs that are used in construction by mapping FAOSTAT production data to the Eora Global Supply Chain Database's consumption data. They estimated the quantity of wood used in construction for the top 10 hardwood-product-producing countries (all of which are included in our analysis). For all other countries that produce hardwood products, they provided a single ratio. The ratios for the top 10 countries and the remainder are presented in Table A7.

This parameter impacts the average half-life assigned to LLPs because the half-life varies depending on whether a product is used for construction or other uses. Zhang et al. (2020) provide half-lives derived from a meta-analysis for several different countries, many of which are relevant to our model. Where this information is not available, Zhang et al. defer to the IPCC (Pingoud et al. 2006), stating that LLPs in construction have a half-life of 40 years, whereas all other LLPs have a half-life of 23 years. Table A8 shows the half-lives for construction material and other LLPs for each country.

Table A8 | Half-lives for LLP in construction and other use

COUNTRY/REGION	HALF-LIFE FOR LLPS IN CONSTRUCTION (YEARS)	HALF-LIFE FOR OTHER LLPS (YEARS)
Canada	66	29
United States	65	30
Germany	35	17
Ireland	67	30
Finland	21	23 (default)
France	17	11
Czech Republic	45	23 (default)
Portugal	21	14
Switzerland	55	35
Spain	17	12
European Union (other)	43	27
Japan	33	20
All other countries	40	23

Note: LLP = long-lived product.

Source: Authors' calculations.

We use these half-lives to calculate a weighted average half-life based on the percent of LLPs in construction in Table A7. The calculation is as follows: (% LLP in construction x half-life for LLP in construction) + ([1 – % LLP in construction] x half-life for other LLP). The resulting half-lives for LLPs are between 12 and 47 for the 30 countries.

Table A9 | Parameters used to generate substitution factor

AVOIDED TONS CONCRETE/TON WOOD USED	AVOIDED TONS STEEL/ TON WOOD USED	EMISSIONS FACTOR FOR CONCRETE	EMISSIONS FACTOR FOR STEEL	EMISSIONS FACTOR FOR WOOD
2.91	0.39	0.15	2.11	0.44

Source: Churkina et al. (2020).

We currently use a default substitution factor of 1.2 tC avoided per ton of carbon in wood (Leskinen et al. 2018). However, the substitution factor is compiled from several subfactors, which include the production emissions for the wood product, the production emissions for construction products (concrete and steel), and the quantity of concrete and steel replaced by each ton of wood. This information is not provided in the Leskinen et al. (2018) meta-analysis or in most of the papers that served as inputs to that analysis.

We designed our model to include each of these factors and then adjusted the parameters to generate a substitution value for wood used in construction to replace concrete and steel. Table A9 shows the results. In the stand-level analysis, we also tested a different set of substitution parameters from a recent study (Churkina et al. 2020).

The substitution factor (SF) can be calculated as

$$SF = (AC \times EFC + AS \times EFS - EFW) / CF_1 / CF_2$$

AC: Avoided tons of concrete per dry ton of wood (t concrete/t wood)

AS: Avoided tons of steel per dry ton of wood (t steel/t wood)

EFC: Emissions factor for concrete (tCO_2e/t concrete)

EFS: Emissions factor for steel (tCO_2e/t steel)

EFW: Emissions factor for wood (tCO_2e/t wood)

CF1: Conversion factor from CO_2e to carbon = 3.67 CO_2e/C

CF2: Conversion factor from dry wood tons to carbon tons = 0.5 tC/t dry matter

We used a substitution factor of 0.44, derived from the above parameters, to compare with the 1.2 average.

Our current scenarios effectively use our best estimate for these ratios. We have run the model assuming that 50 percent of LLPs produced are used for construction and 75 percent of that construction material actually displaces fossil fuels related to concrete and steel production.

A.3 Future Wood Supply Scenarios Descriptions

We analyze seven different scenarios. For each scenario, we calculate the carbon impacts and land-use requirement with two supply levels. In the first supply level, timber supply remains constant at 2010 levels, and "BAU" means that timber supply changes according to a business-as-usual projection.

Scenarios 1 and 2 explore the effects of changes in timber production and the difference between allowing a natural forest to regenerate after harvesting rather than converting it to a plantation. This serves as a bounding exercise because, in reality, a mix of natural regeneration and conversion to plantation occurs at the margin. Scenario 3 is the same as Scenario 1, except that the wood supply from the secondary forest is sourcing from mature forests as well.

- **Scenario 1 (secondary forest harvest and regrowth)** assumes that the existing plantations are supplying wood at our best estimate of their present growth rates. Additional wood demand is met by the harvest of wood from middle-aged secondary forests (stands aged 20–80 years) and the forests are allowed to regrow for 40 years. This scenario also assumes that all wood is supplied by at least small clear-cuts, and it measures the area of such clear-cuts.
- **Scenario 2 (secondary forest harvest and conversion)** assumes that the existing plantations are supplying wood at present growth rates and that after secondary forest areas are harvested as Scenario 1, they are reestablished as plantations (assume at productive locations with at least the present growth rates of secondary forests) to maximize the amount of future wood supplied by plantations. Plantations have substantially higher output of wood per hectare per year and are typically harvested more efficiently than natural forests, which means

that more of the wood felled is utilized for wood instead of being left as deadwood in the forest. This scenario is designed to analyze the effects of a high level of intensification in forest management.

Although we assume that the same lands are replanted as plantations, something similar to this scenario could also occur if natural forests continue to be cleared in some areas while plantations are regrown in others. In China, for example, as discussed above, the large-scale conversion of less productive agriculture lands to plantations is associated with a heavier reliance on imported foods associated with a large quantity of offsetting deforestation (Pendrill, Persson, Godar, Kastner, et al. 2019). On a global basis, growth of plantations on abandoned agricultural land can therefore indirectly achieve a conversion of natural forests to plantations.

- **Scenario 3 (secondary forest mixed harvest)** is similar to Scenario 1 except that 50 percent of wood demand is provided by middle-aged secondary forests (20–80 years) and 50 percent is provided by mature secondary forests (80–140 years). Both secondary forests are harvested at the same slash rates.
- **Scenario 4 (new tropical plantations)** assumes that 68 Mha of tropical agricultural lands become available for establishing highly productive plantations in the tropics and are harvested evenly between 2020 and 2050 (2 Mha per year since the first harvest occurs after 7 years). All new plantations are located in existing agricultural lands in the tropics and neotropics, where yields are higher. The secondary forests are harvested less due to the wood supply from the new tropical plantations. This scenario assumes that these lands have been spared from agriculture, so the carbon costs of using these lands for plantations is the loss of carbon sequestration that would otherwise occur in regrowing secondary forests.
- **Scenario 5 (higher plantation productivity)** is identical to Scenario 1 but assumes that existing plantation forest growth rates increase by 25 percent between 2010 and 2050.
- **Scenario 6 (higher harvest efficiency)** is identical to Scenario 1 but assumes that existing tropical secondary forest harvest efficiency increases so that the slash rate reduces to the level of best practices as described by Ellis et al. (2019).
- **Scenario 7 (50 percent less 2050 fuelwood demand)** is a variant of Scenario 1 in which fuelwood demand in 2050 reduces by half compared to the demand under the BAU projection in Scenario 1.

APPENDIX B: LITERATURE REVIEW OF PUBLISHED FORESTRY AND CLIMATE STUDIES

Table B1 characterizes the literature we reviewed regarding the climate consequences of harvesting wood, including its use in construction material and other LLPs. (This list does not include papers primarily focused on bioenergy although bioenergy factors into many of the papers below.)

The first group of papers in the table factors in changes in all carbon pools, which we consider the appropriate form of accounting. These papers in turn are divided into two categories (although some papers belong in both): the first category (fifth column) analyzes specific scenarios in which a high majority of the wood is used for construction material and results in net GHG benefits either immediately or within the first 30 years at least if combined with a substantial substitution value (reduction in fossil emissions in construction material); the second category (sixth column) focuses on the typical end uses of wood, which do not find benefits in these periods.

The second group of papers assumes that harvested wood is carbon neutral. These papers do not factor in emissions of carbon to the air from the reduction of carbon in the forest, which is usually justified by the claim that wood is carbon neutral if sustainably managed. We explain in the main text our disagreement with this assumption. These papers all compare the fossil emissions from producing and using wood products with the fossil emissions (and process emissions from making concrete and steel) of construction materials or other products replaced by wood. This is the potential "substitution benefit." These papers typically find climate benefits from harvests at least for replacing many construction materials.

We add some additional categories for description. All papers in this carbon neutral category count the substitution benefits. Those with a check box in the third column also factor in carbon benefits from stored wood products. In other words, if wood is harvested and turned into furniture or a building, the carbon stored in those products is counted as a reduction in carbon in the air although the carbon reduction in the forest is not counted. The fourth column signifies papers that generally do not assume that all sustainably managed wood is carbon neutral; they analyze scenarios that assume all additional wood used for construction is diverted from uses of wood for pulp or other short-lived purposes, and those uses are not replaced. For several of these papers, such as Smyth et al. (2020) or Xu et al. (2018), that is simply an assumption in a potential scenario, and these papers do not assert that such wood product diversion will happen or is likely.

The carbon consequences in all of these papers are purely biophysical. None of these papers incorporates any economic analysis to claim that additional wood demand will lead to additional carbon storage due to changes in economic price effects. (Some papers use economic analysis for other purposes, such as to estimate prices.)

Table B1 | Forestry and Climate Studies Reviewed

PAPER	CARBON-NEUTRAL ASSUMPTION	CARBON-NEUTRAL ASSUMPTION PLUS WOOD PRODUCT STORAGE	ASSUMES SHIFT FROM PAPER PRODUCTS OR IGNORES PRODUCT DISPLACEMENT	FACTORS IN ALL CARBON POOLS AND FINDS SHORT-TERM BENEFITS USING SPECIFIC OPTIMISTIC SCENARIOS	FACTORS IN ALL CARBON POOLS AND FINDS AT LEAST NET COSTS FOR AT LEAST SEVERAL DECADES BASED ON PRESENT OR COMMON WOOD USAGE
Counts all Carbon Pools					
Chen et al. (2018)				Y	Y
Gustavsson et al. (2017)					Y
Gustavsson et al. (2021)				Y	Y
Ingerson (2009)					Y
Kalliokoski et al. (2020)					Y
Keith et al. (2015)					Y
Law et al. (2018)					Y
Oliver et al. (2014)				Y	Y
Peñaloza et al. (2016)				Y	
Schlamadinger and Marland (1999)					Y
Skytt et al. (2021)					Y
Smyth et al. (2020, also listed below)					Y
Assumes Wood Is Carbon Neutral					
Achachlouei and Moberg (2015)	Y				
Ayikoe Tettey et al. (2019)	Y	Y			
Bergman et al. (2014)	Y	Y			
Bolin and Smith (2011)	Y				
Brunet-Navarro et al. (2017)	Y		Y		
Buchanan and Levine (1999)	Y	Y			
Churkina et al. (2020)		Y	Y		
Dodoo et al. (2009)	Y				
Durlinger et al. (2013)	Y	Y			
Betser and McCulloch (2019)	Y?	Y?			
Eriksson (2004)	Y				
Eriksson et al. (2012)	Y	Y	Y		

Table B1 | Forestry and Climate Studies Reviewed (cont.)

PAPER	CARBON-NEUTRAL ASSUMPTION	CARBON-NEUTRAL ASSUMPTION PLUS WOOD PRODUCT STORAGE	ASSUMES SHIFT FROM PAPER PRODUCTS OR IGNORES PRODUCT DISPLACEMENT	FACTORS IN ALL CARBON POOLS AND FINDS SHORT-TERM BENEFITS USING SPECIFIC OPTIMISTIC SCENARIOS	FACTORS IN ALL CARBON POOLS AND FINDS AT LEAST NET COSTS FOR AT LEAST SEVERAL DECADES BASED ON PRESENT OR COMMON WOOD USAGE
Geng et al. (2017)	Y	Y			
Grann (2013)	Y	Y, plus regrowth			
Guest et al. (2013)		Y			
Guo et al. (2017)	Y	Y			
Gustavsson et al. (2006)	Y	Y, plus regrowth			
John et al. (2009)	Y	Y			
Jönsson et al. (1997)	Y				
Kayo and Noda (2018)		Y, plus regrowth			
Kayo et al. (2011)	Y	Y			
Kayo et al. (2015)	Y	Y			
Knight et al. (2005)	Y				
Lan et al. (2020)		Y, plus regrowth			
Li and Altan (2011)	Y	Y	Y		
Lippke et al. (2004)	Y	Y			
Lippke et al. (2011)		Y			
Liu et al. (2016)	Y	Y			
Lu, El Hanandeh, Gilbert, and Bailleres (2017)	Y	Y			
Lu and El Hanandeh (2017)	Y	Y			
Lu, El Hanandeh, and Gilbert (2017)	Y	Y			
Noda et al. (2014)	Y	Y			
Noda et al. (2016)	Y	Y			
Padilla-Rivera et al. (2018)	Y				
Perez-Garcia et al. (2004)		Y			
Petersen and Solberg (2002)	Y	Y			
Petersen and Solberg (2004)	Y	Y			
Pierobon et al. (2019)	Y	Y			

Table B1 | Forestry and Climate Studies Reviewed (cont.)

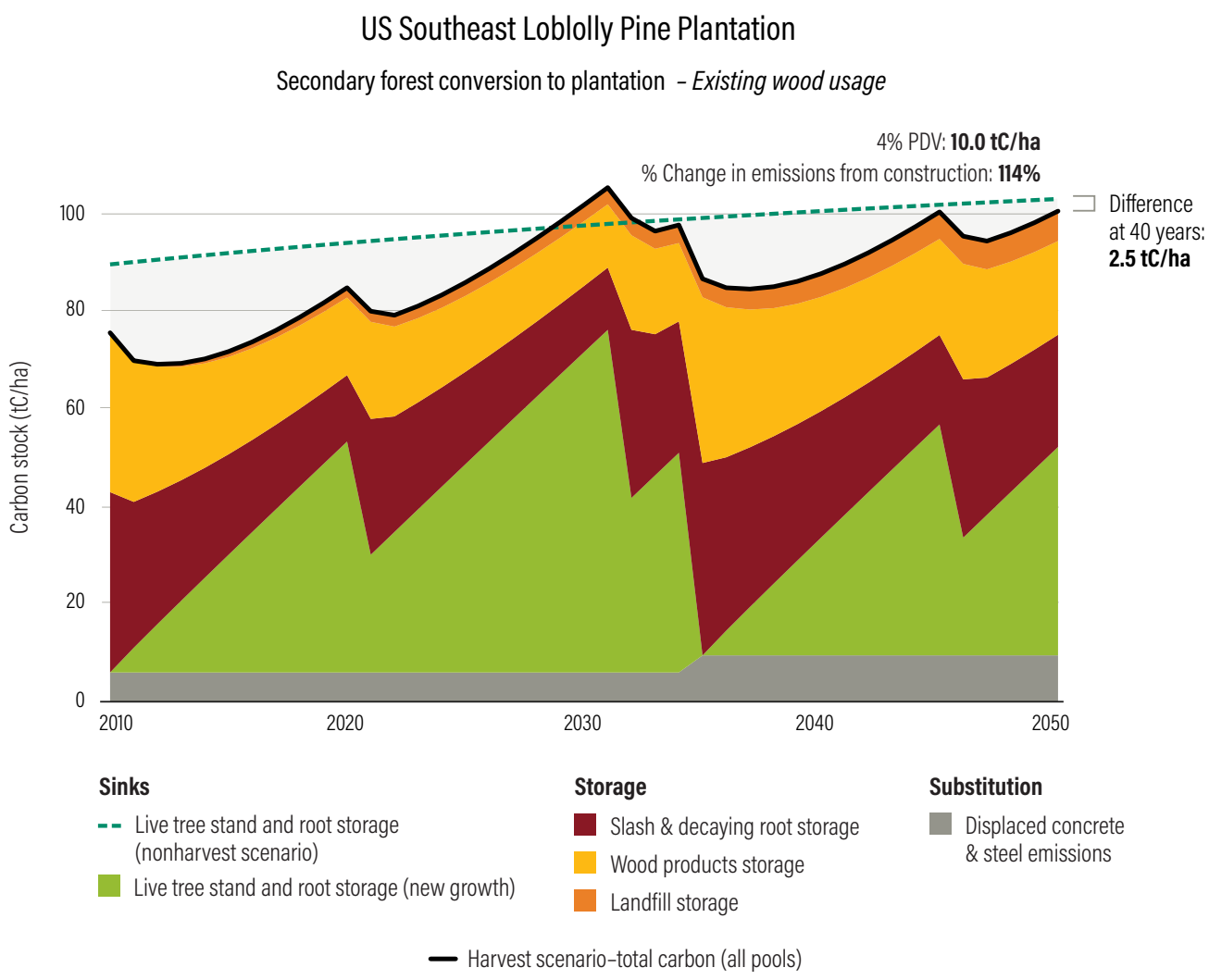
PAPER	CARBON-NEUTRAL ASSUMPTION	CARBON-NEUTRAL ASSUMPTION PLUS WOOD PRODUCT STORAGE	ASSUMES SHIFT FROM PAPER PRODUCTS OR IGNORES PRODUCT DISPLACEMENT	FACTORS IN ALL CARBON POOLS AND FINDS SHORT-TERM BENEFITS USING SPECIFIC OPTIMISTIC SCENARIOS	FACTORS IN ALL CARBON POOLS AND FINDS AT LEAST NET COSTS FOR AT LEAST SEVERAL DECADES BASED ON PRESENT OR COMMON WOOD USAGE
Pingoud et al. (2012)	Question carbon neutral hypothesis				
Robertson et al. (2012)	Y	Y			
Rüter et al. (2016)	Y	Y			
Salazar and Meil (2009)	Y	Y			
Sandanayake et al. (2018)	Not specified				
Sandin et al. (2014)	Y				
Santi (2015)	Y	Y			
Sathre and O'Connor (2010)	Y	Y			
Sedjo (2002)	Y	Y	Y		
Simone Souza et al. (2017)	Y				
Skullestad et al. (2016)		Y			
Smyth et al. (2014)		Y	Y		
Smyth et al. (2017)		Y			
Sommerhuber et al. (2017)	Y	Y			
Suter et al. (2017)	Y	Y			
Werner et al. (2005)	Y	Y			
Werner et al. (2010)	Y	Y	Y		
Xu et al. (2018)	Y	Y	Y		
Zeitz et al. (2019)	Y				

Source: Authors.

APPENDIX C: GRAPHICAL EXPLANATION OF TIME DISCOUNTING AND RESULTS AFTER 40 YEARS AT DIFFERENT DISCOUNT RATES

Discounting applies a different value to the change in carbon emissions (or removals) as a result of the harvest based on its changing value over time. In Figure C1, we use the loblolly pine conversion to plantation scenario to illustrate the change in carbon pools. In the first year of harvest, there is a net increase in carbon emissions (represented by the vertical difference between the dotted green line and the solid black line). These emissions are valued at 100 percent. In the second year, there are additional emissions, which can be seen by an expanding distance between the two lines. The expansion represents additional emissions, but they are valued at a 4 percent lower cost because they occur one year later. The last years are net gains, illustrated by the closing distance between the two lines. These emissions are also valued, but again they are valued in present discount value terms at a 4 percent discount rate. Table C1 shows the calculation, including the absolute change after 40 years, with the last column showing the calculation in PDV terms.

Figure C1 | Loblolly Pine Secondary Forest Conversion to Plantation



Notes: PDV = present discount value. tC/ha = tons of carbon per hectare.

Source: Carbon Harvest Model.

Table C1 | Example Time Discounting (4 Percent) Carbon Changes over 40 Years for Loblolly Pine Conversion to Plantation Scenario

YEAR	HARVEST	NONHARVEST	HARVEST – NONHARVEST	ABSOLUTE CHANGE IN EMISSIONS (+) OR REMOVALS (-)	DISCOUNT PERCENTAGE	VALUE WHEN DISCOUNTED TO YEAR 1 (tC/ha)
2010	75.6	89.6	14.0	14.0	100	14.0
2011	69.9	90.1	20.2	6.2	96	6.0
2012	69.2	90.6	21.4	1.2	92	1.1
2013	69.4	91.1	21.7	0.3	89	0.3
2014	70.3	91.5	21.2	-0.5	85	-0.4
2015	71.8	92.0	20.2	-1.1	82	-0.9
2016	73.8	92.4	18.6	-1.5	79	-1.2
2017	76.1	92.8	16.7	-1.9	76	-1.5
2018	78.8	93.2	14.4	-2.3	73	-1.6
2019	81.7	93.6	11.9	-2.5	70	-1.8
2020	84.8	94.0	9.2	-2.7	68	-1.8
2021	80.0	94.4	14.4	5.2	65	3.4
2022	79.2	94.8	15.6	1.2	62	0.7
2023	81.1	95.2	14.1	-1.5	60	-0.9
2024	83.4	95.5	12.2	-1.9	58	-1.1
2025	85.9	95.9	10.0	-2.2	56	-1.2
2026	88.8	96.3	7.5	-2.5	53	-1.3
2027	91.8	96.6	4.8	-2.7	51	-1.4
2028	95.0	96.9	1.9	-2.9	49	-1.4
2029	98.3	97.3	-1.1	-3.0	47	-1.4
2030	101.8	97.6	-4.2	-3.1	46	-1.4
2031	105.4	97.9	-7.4	-3.2	44	-1.4
2032	99.1	98.2	-0.9	6.6	42	2.8
2033	96.4	98.5	2.1	3.0	41	1.2
2034	97.7	98.8	1.1	-1.0	39	-0.4
2035	86.7	99.1	12.5	11.3	38	4.3
2036	84.8	99.4	14.6	2.1	36	0.8
2037	84.6	99.7	15.1	0.5	35	0.2

Table C1 | Example Time Discounting (4 Percent) Carbon Changes over 40 Years for Loblolly Pine Conversion to Plantation Scenario (cont.)

YEAR	HARVEST	NONHARVEST	HARVEST – NONHARVEST	ABSOLUTE CHANGE IN EMISSIONS (+) OR REMOVALS (-)	DISCOUNT PERCENTAGE	VALUE WHEN DISCOUNTED TO YEAR 1 (tC/ha)
2038	85.1	100.0	14.9	-0.2	33	-0.1
2039	86.2	100.3	14.1	-0.8	32	-0.3
2040	87.7	100.6	12.8	-1.3	31	-0.4
2041	89.7	100.8	11.1	-1.7	30	-0.5
2042	92.0	101.1	9.1	-2.0	29	-0.6
2043	94.6	101.3	6.7	-2.3	27	-0.6
2044	97.4	101.6	4.2	-2.5	26	-0.7
2045	100.4	101.8	1.5	-2.7	25	-0.7
2046	95.4	102.1	6.7	5.2	24	1.3
2047	94.4	102.3	7.9	1.2	23	0.3
2048	96.1	102.6	6.5	-1.5	23	-0.3
2049	98.2	102.8	4.6	-1.8	22	-0.4
2050	100.5	103.0	2.5	-2.1	21	-0.4
			Difference at 40 years	2.5	4% PDV	10.0

Notes: PDV = present discount value. In the example, the U.S. Southeast site is converted to loblolly pine plantation based on existing wood usage and with substitution effect. The absolute carbon change over 40 years (summing the column) is 2.5 tons of carbon emissions per hectare (tC/ha) and the present discount value is 10 tC/ha.

Source: Carbon Harvest Model.

Table C2 shows the global results with different discount rates. For example, in the secondary growth scenario, the gross emissions vary between 4.1 $GtCO_2$e/year with either a 4 percent or 6 percent discount rate and 3.9 $GtCO_2$e/year with a 0 percent discount rate. The 0 percent discount rate scenario also shows the absolute results after 40 years (annualized by dividing by the number of years).

Table C2 | Annual Average Time-Discounted Carbon Costs of Global Forestry at Different Discount Rates for Seven Scenarios over 40 Years

		DISCOUNTED VALUE TO YEAR OF HARVEST ($GTCO_2E$)						
		(1) SECONDARY FOREST HARVEST AND REGROWTH	(2) SECONDARY FOREST HARVEST AND CONVERSION	(3) SECONDARY FOREST MIXED HARVEST	(4) NEW TROPICAL PLANTATIONS	(5) HIGHER PLANTATION PRODUCTIVITY	(6) HIGHER HARVEST EFFICIENCY	(7) 50% LESS 2050 FUELWOOD DEMAND
0% (no discount)	Gross emissions	3.9	3.6	3.9	3.5	3.2	3.7	3.4
	Net emissions with substitution savings	2.9	2.5	2.9	2.6	2.2	2.7	2.5
2%	Gross emissions	4	3.7	4.1	3.6	3.4	3.8	3.6
	Net emissions with substitution savingss	3.1	2.7	3.1	2.7	2.5	2.9	2.7
4% (default)	Gross emissions	4.1	3.7	4.2	3.6	3.5	3.9	3.6
	Net emissions with substitution savings	3.2	2.7	3.2	2.8	2.6	3	2.8
6%	Gross emissions	4.1	3.7	4.2	3.6	3.6	4	3.6
	Net emissions with substitution savings	3.2	2.8	3.3	2.8	2.7	3.1	2.8

Note: $GtCO_2e$ = Gigatons of CO_2 equivalent.

Source: Authors' calculations.

APPENDIX D: PAPERS ASSESSING THE BIOPHYSICAL EFFECTS OF HARVESTING WOOD FOR BIOENERGY

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APPENDIX E: THE EFFECTS OF DISCOUNTING OVER 100 YEARS

To further examine the effect of discounting, we applied a 4 percent discount rate over 100 years as well as 40 years to our secondary regrowth scenario. Discounting is applied to each secondary stand harvested (including the carbon pools of various wood products) over a period of 40 years or alternatively 100 years after the harvest.

In general, with one exception, the only meaningful differences are in scenarios that involve existing plantations and 70 percent CLT. In this context, very high growth rates for plantations and high utilization rates for construction material mean that over time, there are increasing benefits to using the area to grow wood for construction. That is true even when the value of these benefits is discounted to the original year of harvest.

The significance differences are for existing plantations with the exception of conversion of secondary forest to plantation in Brazil. There are also significant additional benefits when converting secondary forests to plantation in Brazil.

Even though 100 years of discounting has a meaningful effect compared to 40 years of discounting in these plantation scenarios, the 70 percent CLT rate will be very hard to achieve.

Table E1 | Differences in Carbon Effects with Costs of Harvesting Wood for Construction, Discounting 100 versus 40 Years

SCENARIO	EXISTING WOOD USAGE			40% WOOD FOR MASS TIMBER			70% WOOD FOR MASS TIMBER			EXISTING WOOD USAGE			40% WOOD FOR MASS TIMBER			70% WOOD FOR MASS TIMBER		
SUBSTITUTION FACTOR	0.44 tC/tC									1.2 tC/tC								
	100	40	Diff	100	40	Diff	100	40	Diff	100	40	Diff	100	40	Diff	100	40	Diff
U.S. Pacific Northwest Hemlock-Sitka spruce																		
Secondary forest and regrowth	124	125	1	87	87	0	47	47	-1	115	116	1	46	46	0	-24	-24	-1
Secondary forest and conversion to plantation	127	115	-12	83	76	-7	37	36	-1	116	105	-11	36	35	0	-45	-35	11
Existing plantation	76	79	3	30	48	18	-18	15	33	64	71	7	-19	15	34	-103	-42	61
U.S. Pacific Northwest Douglas Fir																		
Secondary forest and regrowth	151	150	-1	109	107	-1	65	63	-2	140	139	-1	64	62	-1	-13	-16	-2
Secondary forest and conversion to plantation	150	136	-14	102	93	-9	52	48	-4	137	125	-13	51	48	-3	-37	-30	7
Existing plantation	71	72	1	29	43	14	-15	13	28	61	65	4	-16	13	29	-95	-41	54
U.S. Southeast Oak-hickory																		
Secondary forest and regrowth	36	37	2	18	19	1	-1	0	1	31	33	2	-1	0	1	-34	-33	1
Secondary forest and conversion to loblolly plantation	36	35	-1	13	13	1	-11	-9	2	30	29	0	-12	-9	3	-54	-49	5
U.S. Southeast Loblolly-shortleaf pine																		
Existing plantation	16	16	0	4	5	2	-9	-6	3	13	13	1	-10	-6	3	-33	-27	6
Brazil																		
Secondary forest and regrowth	33	34	1	19	20	1	7	8	1	30	31	1	5	6	1	-15	-14	1
Secondary forest and conversion to plantation	25	26	1	-28	-19	9	-78	-62	16	14	17	3	-82	-63	18	-171	-138	33
Existing plantation	-6	-6	0	-58	-50	8	-109	-94	15	-17	-15	2	-111	-94	17	-202	-170	32

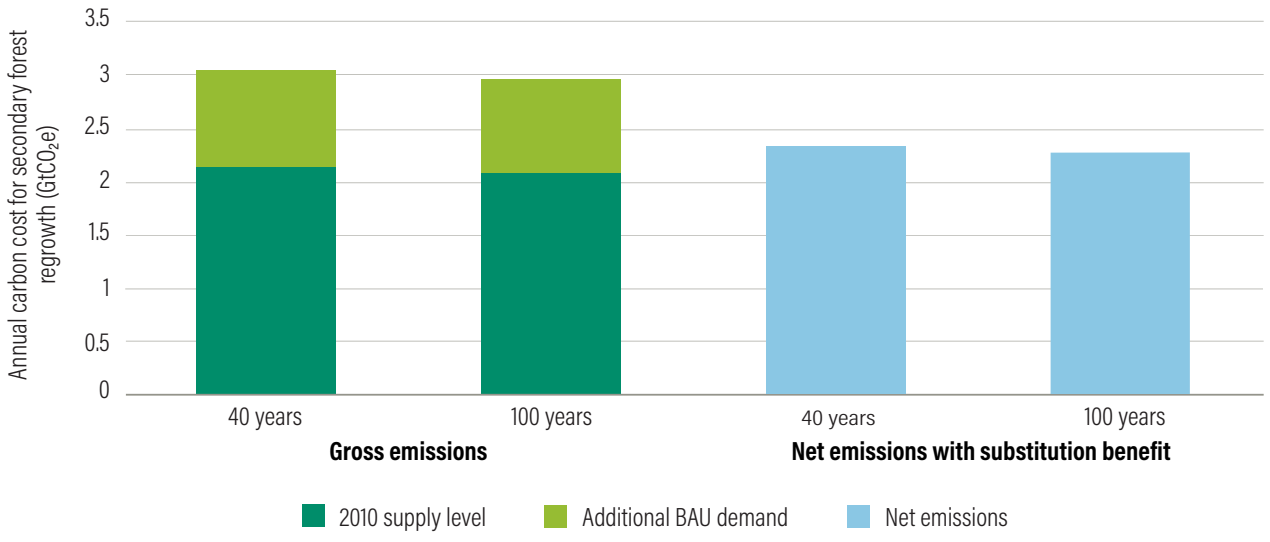
Table E1 | Differences in Carbon Effects with Costs of Harvesting Wood for Construction, Discounting 100 versus 40 Years (cont.)

SCENARIO	EXISTING WOOD USAGE			40% WOOD FOR MASS TIMBER			70% WOOD FOR MASS TIMBER			EXISTING WOOD USAGE			40% WOOD FOR MASS TIMBER			70% WOOD FOR MASS TIMBER		
SUBSTITUTION FACTOR	0.44 tC/tC									1.2 tC/tC								
	100	40	Diff	100	40	Diff	100	40	Diff	100	40	Diff	100	40	Diff	100	40	Diff
Indonesia																		
Secondary forest and regrowth	24	25	1	23	24	1	15	16	1	-20	-21	-1	13	14	1	-1	0	1
Secondary forest and conversion to plantation	19	22	3	13	18	5	-23	-13	10	-2	-9	-6	-26	-14	12	-89	-67	22
Existing plantation	-6	-4	3	-13	-9	4	-49	-40	9	22	16	-5	-51	-40	11	-116	-95	21
Germany																		
Secondary forest and regrowth	60	61	0	50	51	0	28	28	0	54	54	0	26	26	0	-14	-15	0
Secondary forest and conversion to plantation	62	58	-4	51	48	-3	27	25	-1	55	52	-3	25	24	-1	-20	-17	2
Existing plantation	46	61	15	36	55	19	12	40	28	39	57	18	10	40	29	-33	13	46

Notes: Analysis shows present discount t value in tons of carbon per hectare of harvest using 4 percent discount rate. Positive means increased emissions; negative means carbon savings. Green cells show results of 100 years that are less adverse than those of 40 years for the climate while pink cells show results of 100 years that are more adverse than those of 40 years for the climate. The zero values can represent either negative small values (red cells) or positive small values (green cells) due to rounding.

Source: Carbon Harvest Model.

Figure E1 | Difference between 40-Year and 100-Year Discounting for Secondary Forest Regrowth Scenario (Scenario 1) with 4 Percent Discounting



Note: BAU = business as usual. $GtCO_2e$ = Gigatons of CO_2 equivalent.

Source: Carbon Harvest Model.

ABBREVIATIONS

AGB	aboveground biomass
BAU	Business as usual
BEF	Biomass expansion factor
BGB	Belowground biomass
Bha	billon hectares
C&S	concrete and steel
CHARM	Carbon Harvest Model
CLT	cross-laminated timber
CO_2e	carbon dioxide equivalent
DM	dry matter
FAO	Food and Agriculture Organization of the United Nations
FE	fixed effects
FLUS	Future Land Use Simulation
GHG	greenhouse gas
GR1	growth rate of less than 20 years of age
GR2	growth rate of greater than 20 years of age
GRUMP	Global Rural-Urban Mapping Project
GtC	gigaton of carbon
$GtCO_2e$	gigaton of carbon dioxide equivalent
GWP	global warming potential
IIASA	International Institute for Applied Systems Analysis
IND	industrial roundwood
IND-M	main industrial roundwood
IND-O	other industrial roundwood
IND-PS	industrial roundwood used for pulping and sawing
IPCC	Intergovernmental Panel on Climate Change
LCA	life cycle assessment
LINE	linear extrapolation
LLP	long-lived product
LLP-M	main long-lived product
LLP-O	other long-lived product
LPG	liquefied petroleum gas
MgC	megagram of carbon
Mha	million hectares
NPP0	net primary productivity of native vegetation
OECD	Organisation for Economic Co-operation and Development
OSB	oriented strand board
PDV	present discount value
PPB	paper and paperboard
PS	pulp and sawn
RSE	residual standard error
SF	substitution factor
SLP	short-lived product
SNW	sawn wood
SR	Slash rate
SSP	Shared Socioeconomic Pathway
tC	tons of carbon
UNEP	United Nations Environment Programme
VSLP-IND	very-short-lived product, industrial waste
VSLP-IND-O	very-short-lived product, other industrial roundwood waste
VSLP-WFL	very-short-lived product, wood fuel
WBP	wood-based panels
WPL	wood pulp

ENDNOTES

1. Houghton and Nassikas (2017) estimated total carbon losses of around 150 Gt. Agricultural land use was found to result in a cumulative loss of 133 GtC in the upper two meters of soil, a difference between potential (3,144 GtC) and 2010 soil organic carbon stocks (3,011 GtC; Sanderman et al. 2017), or a cumulative loss of 98 GtC in croplands for 1850–2015 (Houghton and Nassikas 2017). Carbon losses from wood harvesting (including the oxidation of woody debris and wood products) between 1850 and 2015 were 135 GtC, but these losses were offset by 109 GtC from the forest regrowth after harvest, leading to net losses from wood harvesting of only 25. GtC, 17 percent of the land-use-induced historical cumulative emissions.

2. See MAPA n.d.

3. Beef imports to China increased by 1.2 million metric tons of beef during this period (Wiedower 2019). At even an optimistic yield of 100 kilograms of beef per hectare per year, substantially more than typically generated in Brazil's Cerrado (Cardoso et al. 2016), that implies 12 Mha producing beef for China.

4. In theory, losses due to forestry on land adjacent to actual forest clearings could be captured by bookkeeping methods. But this paper also summarized evidence that clearings in tropical forests also led to substantial carbon loss due to various physical forms of forest degradation, such as temperature effects and loss of seed dispersal due to effects on wildlife. Another major factor is the failure to count the loss of carbon sequestration in intact forests.

5. See Meinshausen et al. 2009; Figueres et al. 2017. For example, Meinshausen et al. estimated a need to hold emissions to 1,000 Gt between 2000 and 2050 to provide a 75 percent chance of holding warming to 2°C. As carbon dioxide emissions were roughly 600 Gt between 2000 and 2020, that leaves only a 400 Gt gap by 2020.

6. See World Bank n.d.a. The World Bank calculated the poverty head count ratio at $1.90 a day (2011 purchasing power parity).

7. Our estimate relies on dietary projections published by FAO in 2012 (Alexandratos and Bruinsma 2012), which assumed that people in India continue to consume few animal products because of cultural choices and that people in Africa consume even fewer because of poverty. Nearly all other estimates are higher (Valin et al. 2014), and our estimates assume that global growth in the future does not match estimates based entirely on relationships in the past to income and projected income trends (Tilman and Clark 2014).

8. Even the global areas of pasture have estimates that vary by more than 1 Bha (Fetzel et al. 2017), which is partly due to definitions and to poor data. Output per hectare depends on the quantity and quality of grass produced and the different animal characteristics, and the data on these is even worse. A large quantity of feed for cattle in Africa and Asia comes from "cut-and-carry" forages, which are grasses or leaves cut by people and fed to cattle in stalls, but the area and yields of land devoted to producing such forages are basically unknown. Modelers generally use highly stylized estimates of feed, feed production, and productivities to project future estimates.

9. Table Notes-1 lists urban area estimates from different sources based on different definitions.

Table Notes-1 | Historical Global Urban Extent (Mha)

Dataset	Definition	Resolution	Global urban area
GLC2000[a]	Artificial surfaces and associated areas	~1km	30.8 Mha (0.23%)
GlobCover[b]	Artificial surfaces and associated areas (>50% of a pixel)	~0.3km	31.3 Mha (0.24%)
GRUMP[c]	Not specified; nightlight data	~1km	350.7 Mha (2.64%)
GAEZ[d]	GLC2000 land cover plus population density relationship	5′ (~9km)	152.0 Mha (1.14%)
HYDE v3.1[e]	Built-up area and artificial surfaces and associated areas	5′ (~9km)	53.8 Mha (0.40%)
MODIS v5[f]	Dominated by built-up area (>50% of a pixel)	~0.5km	65.9 Mha (0.50%)

Notes: a. Bartholomé and Belward 2005; b. Bontemps et al. 2011; c. CIESIN et al. 2011; d. Fischer et al. 2012; e. Klein Goldewijk et al. 2010; f. Friedl et al. 2010.

10. To estimate this, we simply scaled our global estimate of carbon losses due to agricultural expansion of 593 Mha, which was 197.5 $GtCO_2e$ over 40 years, to the estimated urban expansion of 80 Mha (197.5 * 80/593 = 26.6).

11. For all models, P values were less than 0.05. If an individual country's fixed effects are included, we found good statistical fits with "full model" R^2 values varying from 0.88 to 0.98 across 12 models. If looking at how much of the country's variation in wood consumption is captured by the model, namely, the country's fixed effects are not included, the "projected model," R^2 values vary from 0.08 to 0.65. Overall, relationships are strong between per capita income and consumption of various

forms of industrial roundwood, but the relationships between income and consumption of fuelwood are much less strong.

12. Wood consumption at the country level was based on the reported production, export, and import of forestry products from FAOSTAT (FAO 2020a). Historical GDP data come from the World Bank (World Bank n.d.a) and future GDP data from the ENV-Growth model SSP2 of the Organisation for Economic Co-operation and Development (OECD). Future population projections, as in Searchinger et al. (2019), came from the United Nations Department of Economic and Social Affairs (UNDESA 2019a). All of the future projections are calibrated to match historical statistics for the reference year of 2010 using an average of 2008–12 to avoid overreliance on the results of year 2010. Future GDP data were obtained from the OECD ENV-Growth model SSP2 (middle of the road) and converted from constant 2005$ to match the World Bank unit in constant 2010$ with an inflation rate of 1.12 (see U.S. Inflation Calculator, https://www.usinflationcalculator.com/).

13. European forest area increased from roughly 25 percent of total land in 1900 to roughly 33 percent today, according to a reconstruction of European land use provided by Richard Fuchs, which is summarized in a number of published papers (including Fuchs et al. 2015 and Fuchs et al. 2013). The role played by the decline of draft animals is summarized by a large decline in forage used for draft animals as reconstructed in Malanima (2020b), used in support of Malanima (2020a).

14. Following personal correspondence with Dr. Rob Bailis at the Stockholm Environment Institute, we developed a substitution factor for the use of VSLPs for energy in wood cookstoves versus propane stoves. According to Dr. Bailis, one must burn only 90 grams (g) of liquefied petroleum gas (LPG) to obtain the same "useful energy" as 1 kilogram (kg) of air-dry wood or charcoal. Assuming perfect combustion, burning 1 kg of wood yields approximately 1.6 $kgCO_2$. The 90 g of LPG, which is 85 percent carbon, yields 0.26 $kgCO_2$. This gives a ratio of 1 $kgCO_2$ avoided from fossil fuels per 5.7 $kgCO_2$ from wood combustion. We incorporate this avoided emissions benefit into our calculation.

15. Indústria Brasileira de Árvores reports an average eucalyptus yield of 35 m^3/ha/year, which is roughly 16 dry tons (IBÁ 2020).

16. Churkina et al. (2020) provides a way of calculating the construction wood demand for newly built urban areas. This wood demand between 2010 and 2050 is the product of additional urban population, wood mass per capita, carbon-to-wood ratio, and the timber replacement pace ratio:

$$M_{2010}^{2050} = (P_{urban}^{2050} - P_{urban}^{2010}) * M_{timber}^{cap} * CW * PR$$

P_{urban}^{2010} = urban population in 2010 for each country
P_{urban}^{2050} = urban population in 2050 for each country
CW = carbon to wood ratio; all calculations are made with a carbon-to-wood ratio of 0.5, which is the global average of 0.476± 0.049 corrected to the first decimal place.
PR = timber replacement pace ratio, which is 0.1, 0.5, and 0.9 for 10 percent to timber, 50 percent to timber, and 90 percent to timber scenarios, respectively; the 10 percent timber scenario refers to countries with the capacity to manufacture mass timber products for the construction of new urban buildings; the 50 percent timber scenario refers to the countries with a high potential to construct new urban buildings with timber; the 90 percent timber scenario refers to the countries with low industrialization levels that will make the transition to timber through the evolution
M_{timber}^{cap} = mass of timber/wood fiber per capita estimated for primary structure and enclosure (Table Notes-2).

Table Notes-2 | Mass of Timber/Wood Fiber per Capita

	Primary structural system	Enclosure system timber	Enclosure system wood fiber
Timber/wood (kg/capita)	5942.50	1104.53	391.98

Source: Churkina et al. 2020, Supplementary Table 3-4.

Additional new urban construction wood demand. Using the SSP2 population and urban population share of 2010 and 2050, we determine that the global urban population increase for this period is 2,760,704,246. We then calculate the global additional construction wood needs for the 10 percent and 50 percent timber scenarios using the above equation based on Churkina et al. (2020), which are 2,053,690,649 and 10,268,453,247 tons of dry matter wood, respectively.

How much change is that? The industrial roundwood (LLP and SLP) demand for the reference year 2010 is 748 million tons of dry matter. Our BAU projection for industrial roundwood in 2050 is 1,332 million tons of dry matter. Figure 17 shows the BAU projection between 2010 and 2050. Assuming a linear increase from 2010 to 2050, BAU wood demand has a 78 percent increase relative to 2010, and the additional wood demand during the 41 years is 11,975 million tons of dry matter (light green triangle in Figure 17). Adding the 10,268,453,247 tons (yellow and brown triangles in Figure 17) to the BAU scenario, the percentage change of timber demand from 2050 to 2010 increases from 88 percent (BAU) to 201 percent (BAU and 50 percent timber scenario).

17. We used the U.S. production and consumption of timber products for 1965–2017 in Howard and Liang (2019, Table 5b). We aggregated the "lumber" and "plywood and veneer" to LLPs and used "pulpwood-based products" for SLPs. We then applied a regression analysis upon LLP production and SLP

production or consumption. We found that LLP production does not respond with SLP production (R^2 = 0.003) and consumption (R^2 = 0.002).

18. The paper also studied some obviously beneficial options that involve shifting the uses of wood, such as shifting paper production into LLPs. Those benefits, which are independent of harvesting less, would depend on reduced paper consumption and result from that reduced consumption.

19. This paper interestingly found the same general result when also factoring in changes in albedo.

20. This result reflects the paper's midrange estimate for substitution values.

21. That is the estimated savings for wood used in multistory housing in Smyth et al. (2017), which is the type of housing likely to use structural panels.

22. The comparison requires knowledge of how much wood substitutes for how much concrete and steel and the information attributed to each product.

23. Churkina et al. (2020) do not actually provide the substitution value, but their supplement provides all the information necessary to calculate the substitution value. According to the inputs provided, using wood to replace "composite" steel and concrete buildings saves 0.51 tC/tC in wood for residential housing and 0.44 tC/tC in wood for commercial buildings. The percentage reductions are our calculations that follow from the numbers provided in the Churkina et al. (2020) supplement of production emissions intensities for each product (ignoring changes in forest carbon) and the quantities used in different forms of construction. The example given is for composite systems of steel and concrete, the most likely alternative construction forms (and they are similar to replacing wholly concrete or wholly steel construction systems provided by the paper).

24. See U.S. Inflation Calculator, https://www.usinflationcalculator.com/.

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Natural resources are at the foundation of economic opportunity and human well-being. But today, we are depleting Earth's resources at rates that are not sustainable, endangering economies and people's lives. People depend on clean water, fertile land, healthy forests, and a stable climate. Livable cities and clean energy are essential for a sustainable planet. We must address these urgent, global challenges this decade.

Our Vision

We envision an equitable and prosperous planet driven by the wise management of natural resources. We aspire to create a world where the actions of government, business, and communities combine to eliminate poverty and sustain the natural environment for all people.

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COUNT IT

We start with data. We conduct independent research and draw on the latest technology to develop new insights and recommendations. Our rigorous analysis identifies risks, unveils opportunities, and informs smart strategies. We focus our efforts on influential and emerging economies where the future of sustainability will be determined.

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We use our research to influence government policies, business strategies, and civil society action. We test projects with communities, companies, and government agencies to build a strong evidence base. Then, we work with partners to deliver change on the ground that alleviates poverty and strengthens society. We hold ourselves accountable to ensure our outcomes will be bold and enduring.

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NZS review
Ministry for the Environment
And
Redesigning the NZ ETS permanent forest category consultation
Ministry for Primary Industries

Submission on the review of the New Zealand Emissions Trading Scheme and a redesigned NZ ETS permanent forest category

The New Zealand Emissions Trading Scheme (NZ ETS) relates strongly to the work of the Taranaki Regional Council (TRC). To ensure the well-being of Taranaki communities, TRC places great importance on successful climate mitigation and ensuring a just transition to a low carbon future. The differing forestry incentives created by the NZ ETS also have a large impact on the Council's broader environmental functions. The extent and type of forestry effects biodiversity, erosion control, natural hazard risk and sediment loads in rivers.

To support effective climate action, TRC supports the intent of redesigning the NZ ETS to better drive gross emissions reductions. Carbon removal through forestry cannot be relied upon forever to drive mitigation. And the longer the country leaves action on reducing gross emissions, the greater the risk of either a failure to abate or significant transition shocks. As emphasized by the He Pou a Rangi Climate Change Commission in their 2023 draft advice, it is clear that under the current settings, the NZ ETS will not drive the change the country needs.

TRC also supports changes to the permanent forest category in the NZ ETS. The locking up of large swathes of the country in certain exotics, mainly *Pinus radiata*, carries with it both risk and significant opportunity cost. Risks from wilding pines and the impacts of pests, diseases and extreme weather events undermining long-term carbon storage. And opportunity costs around the wider biodiversity benefits that could be provided through native afforestation. There is also the cost from the loss of productive capacity that, while lower-return in the short-term compared to permanent forestry, provides flexibility and opportunities for future generations.

It is also important to emphasize that not all exotics carry the same risks. Some can also provide important benefits; for example, for land stabilization. Any restrictions to the permanent forest category need to be based on a nuanced assessment of different species.

The Council welcomes the consideration given in both documents on potential impacts of Māori interests. Iwi and hapū play an integral role in forest management. On New Zealand's zero carbon journey, it is imperative that the Crown work in partnership with Māori to uphold Te Tiriti o Waitangi principles.

Review of the NZ ETS

The below table sets out TRC's response to select questions in the review of the NZ ETS consultation document.

Question	Response
Do you agree with the summary of the impacts of exotic afforestation?	TRC notes that the impacts focus on permanent exotic afforestation. They do not address the risks associated with the production forestry the NZ ETS also incentivizes. While these risks are managed through other channels, they should still be acknowledged. There is also no mention of the opportunity cost associated with exotic afforestation compared to native.
Do you agree with the case for driving gross emissions reductions through the NZ ETS?	Yes. However, the land-use and technology change to achieve gross emissions reductions will be disruptive, increasing the importance of a strong focus on a just transition and direct support to communities and internationally exposed industries.
Do you agree with our assessment of the cost impacts of a higher emissions price?	TRC agrees with the assessment of costs broadly, but we note there is a lack of detail on modelled costs beyond households (e.g. costs on business and industry).
How important do you think it is that we maintain incentives for removals?	Incentives for removals must remain. They are an important tool for reaching climate goals, can provide economic opportunities, and deliver important co-benefits particular when planted on marginal land. Getting involved in removal activities also provides a good entry point for land-owners to support climate action.
Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals?	Yes. First and foremost the NZ ETS is a tool to meet long-term climate goals. Removals are a key part of this, but are secondary to reducing gross emissions.
Chapter 5: Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term?	Yes. Such a system is essential to support successful climate mitigation.
Are there any additional assessment criteria or considerations that should be taken into account to assess options?	An additional criteria to consider is how much an option provides flexibility for further expansion in the future. For example, the ability to which an option can easily be expanded to capture new sources of sequestration or be coupled with a separate biodiversity initiative.

Of the four options proposed, which one do you prefer? Why?	TRC supports Option 4 to split the NZ ETS into two. This option strikes the best balance between prioritising gross emissions while still providing for removals. A standalone market for gross reductions can ensure the carbon price is sufficient to drive gross reductions. It can also facilitate better pacing of reductions to support a just transition. While the separate removals market ensures forestry remains part of the national climate toolbox. A separate removals market would likely provide more flexibility to include other removal sources in the future (e.g. blue carbon) or integrate with other tools to better overcome the cost barriers to native afforestation (e.g. biodiversity credits).
Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?	A dedicated roadmap or strategy for the ongoing development of the system is needed. For example, how is machine learning being considered to aid in the demarcation of forestry areas, what is the plan for quantifying blue carbon sequestration, or what are the opportunities for mixed exotic-indigenous forestry to increase sequestration while providing biodiversity co-benefits? Noting the separate consultation on biodiversity credits, it is also important that a stand-alone removals market be designed so it can be potentially integrated with other tools in the future. Facilitating this would help reduce administrative costs for applicants.
Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation?	This depends on the structure of the system itself. Environmental co-benefits should be prioritised if they do not interfere with gross emissions reductions. A separate removals market is much more likely to provide for this than the current system.
Should a wider range of removals be included in the NZ ETS?	Additional removals should be included where appropriate accounting methodologies exist and suitable technology solutions exist to make that accounting (including verification) cost-effective. A specific strategy should be developed on how to expand the range of included removals and suitable research incentives created.
What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals?	The release of the consultation document on biodiversity credits is a welcome step to better rewarding relevant co-benefits. TRC also notes that ongoing discussions around how to manage agricultural emissions is also a key opportunity to facilitate smaller scale removals.

Changes to the permanent forest category

The below table sets out TRC's response to select questions redesigned NZ ETS permanent forest category consultation document.

Of the options, what is your preferred approach?	TRC supports the entrance of exotic forests under restricted circumstance, with those circumstances being related to species, planting scale, and regarding Māori owned land. A more robust exercise than provided in the consultation paper is required to determine these exceptions. But key factors to consider include: • a focus on avoiding species that are particularly risky (e.g. wilding risk) and devoid of co-benefits (noting that some exotics can still support native biodiversity for example); • upholding Te Tiriti o Waitangi; and • facilitating small-scale plantings by landowners, especially on marginal land where exotics can provide faster establishing erosion control.
Do you think there is an opportunity to use permanent forests to stabilise erosion-prone land?	Yes and this co-benefit should be factored in when determining where permanent exotic plantings can occur.
Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?	Yes.
Do you agree with the proposal for a specific carbon accounting method for transition forests?	Yes. A bespoke accounting method is needed to incentivise the use of transition forests and lessen the impact for permanent exotic forestry transitioning in the future. A system needs to avoid having to pay back credits as a forest transitions.
Of these options [on forest management], what is your preferred approach? Why? Are there other options you prefer, that we haven't considered?	Consideration should be given to any new forest management requirements being applied differentially based on forest size. It is important to not disincentivize small-scale plantings.
What are your views on forest management plans?	Bespoke forest management plans should, at least initially, focus on large-scale permanent forestry. The rollout of freshwater farm plans will likely provide many useful insights to inform how any system for forest management plans might operate. An ongoing discussion, not a one off consultation, with the sector is also needed to determine roles and responsibilities in any new management system.
Do you think there should be new or expanded	More enforcement tools would be beneficial. Abatement and infringement notices can be a particularly effective tool to promote compliance and ensure issues are caught and

compliance tools for permanent forests?	addressed early. The withholding of units would also prove a particularly strong enforcement tool in the case of serious non-compliance. Finally, any use of bonds needs to be careful to not penalize compliant operations. But they could be useful in the case of transition forests to address the risk of a forest not transitioning.

This content of this submission will be formally considered by the TRC Planning and Policy Committee on 29 August 2023. Any comments or amendments from the Committee will be provided after that meeting.

Yours faithfully

S J Ruru
Chief Executive

United Fresh Response to MfE on Discussion Document: Review of the New Zealand Emissions Trading Scheme

Submitted by:

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Submitted to (etsconsultation@mfe.govt.nz) on 09 August 2023

Introduction

United Fresh is the only pan-produce industry body in New Zealand. Our membership includes seed merchants, growers, grower organisations, packhouses, wholesalers, importers, and service and logistics providers, as well as retailers. Our industry aims to provide New Zealand with a healthy and safe supply of quality produce. Our vision is to create a sustainable fresh fruit and vegetable industry for New Zealand.

United Fresh adopted the United Nations Sustainable Development Goals in 2017.

United Fresh represents an industry that almost every New Zealander interacts with on a daily basis. The fresh produce industry represents a key segment of New Zealand's retail grocery offer, amounting to an average of 10-12% of store sales within the major grocery retailers' revenue portfolio.

On behalf of the New Zealand pan-produce Industry, United Fresh therefore wishes to make a submission on "Discussion Document : Review of the New Zealand Emissions Trading Scheme".

United Fresh also welcomes the opportunity to comment on the proposed changes by way of this submission, as it provides us, as the pan-produce industry body, with the opportunity to enhance our membership's understanding of the issues that have led to the review of the New Zealand Emissions Trading Scheme (NZETS).

Prepared by The United Fresh Technical Advisory Group,
Jacob Lawes, Projects Manager,
Serena Baptist, Projects Officer

Peer Reviewed by Dr Hans Maurer, Chair.

Situation Overview

The Discussion Document Executive Summary gives the following overview of the situation:

> *"Through the Paris Agreement, Aotearoa New Zealand is committed to contributing to global efforts to limit the temperature increase rise to 1.5 degrees Celsius above pre-industrial levels.*
>
> *As part of this commitment, Aotearoa has set a nationally determined contribution (or NDC) under the Paris Agreement. The Government has also introduced a legislative framework for reducing our domestic emissions. This includes a 2050 target, as well as a system of emissions budgets that step progressively towards the 2050 target.*
>
> *In meeting Aotearoa New Zealand's climate change goals, both domestic and international, the Government has agreed that Aotearoa New Zealand's priority will be:*
>
> - *focusing on domestic climate action, rather than purchasing offshore mitigation*
> - *reducing gross emissions*
> - *continuing to support removals to contribute to net emissions targets.*
>
> *As part of its advice for the first emissions reduction plan, He Pou a Rangi | Climate Change Commission (the Commission) recommended that the Government amend the New Zealand Emissions Trading Scheme (NZ ETS) to:*
>
> - *strengthen the incentives for gross emissions reductions.*
> - *manage the amount of exotic forest planting the scheme will drive.*
>
> *The Government is responding by reviewing the NZ ETS. The review aims to clarify the impact that the NZ ETS will have under its current settings and identify the changes that may be needed.*
>
> *Currently, the NZ ETS does not distinguish between emissions reductions and removals. As a result, it is likely the NZ ETS will continue to drive considerable carbon removals from exotic forests. However, it is not expected to:*
>
> - *drive material gross emissions reductions*
> - *lead to significant indigenous afforestation*
> - *promote other nature-based solutions that can remove carbon from the atmosphere.*
>
> *[The] analysis suggests that the current design of the NZ ETS does not align with the Government's decision to prioritise emissions reductions in Aotearoa New Zealand's climate response.*
>
> *As part of this consultation, [MFE wishes] to test whether the NZ ETS should prioritise gross emissions reductions, while maintaining support for removals as the preferred approach to Aotearoa New Zealand's transition to a low-emissions, climate-resilient future".*

United Fresh does not grow trees, and may not be a party directly involved in the NZ ETS for the creation, selling, purchasing, or surrendering of emissions units within the NZ ETS. However, United Fresh represents the fresh pan-produce industry, whose members participate in the NZ ETS scheme. These members face the possibility of changes to the costs they are incurring in participating in the NZ ETS, as well as potentially having new regulations to follow.

As such, it is in the interest of the industry to ensure that it understands the appropriate technical details of proposed changes to systems that may impact how the industry may have to operate in the future, and to present our thoughts on how the changes being considered could be shaped to be effective, efficient, and not have unintended consequences that may limit its applicability.

Question and Response Section

United Fresh notes that the Consultation questions are divided by Chapter within the Discussion Document. Our responses here are therefore similarly divided.

United Fresh also notes that throughout this response, we are using terms and concepts defined in the Discussion Document, which our industry may necessarily be entirely familiar with, which is why we are providing a short definition here:

- Reductions: lowering the overall ongoing emissions of greenhouse gas emissions into the atmosphere, from any source.
- Removals: the process of dealing with already emitted greenhouse gas emissions, by capturing prior emissions from the atmosphere.
- Co-benefits: the additional positive impacts of the proposed NZ ETS revised design, that would benefit New Zealand as a whole.
- New Zealand Units (NZUs): the units bought and sold to represent carbon emissions and carbon removals.

Chapter 2 Questions - Expected impact of current NZ ETS

1. **Question: Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?**

United Fresh partially agrees with the assessment made.

If the modelled assumptions regarding future transitions away from carbon emissions occur at the rate suggested by the New Zealand Government match with the reality in the coming years, United Fresh sees no reason why these models would be inaccurate. However, United Fresh notes that significant global events, such as the Ukraine Conflict, or America's "Inflation Reduction Act" tend to drive rapid innovation and transition away from fossil fuels overseas, causing rapid decreases in demand and/or supply that were likely not accounted for in modelling.

Given this, United Fresh is of the view that the models represent a "status quo" approach, which models a "middle of the road" scenario. However, these models do not represent the expected reality if external forces align in a manner that results in an oversupply of the earlier than the modelled date, which could cause the systemic issues discussed in the Discussion Document to arise several years early.

2. **Question: Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?**

United Fresh does not have any specific data we can share about emissions from within the Fresh Produce industry.

3. **Question: Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?**

United Fresh does not have specific information about land owner and forest investment behaviour.

4. **Question: Do you agree with the summary of the impacts of exotic afforestation? Why/why not?**

United Fresh agrees with the Commission's findings that are summarised on Page 26, regarding the risk of exotic forestry. Exotic forestry creates a risk from the perspective of being a low-cost option to implement, which dis-incentivises other forestry types or any other land use types being considered. Additionally, exotic forestry also creates biodiversity issues for New Zealand in limiting the area of New Zealand that can be reforested in native plantings which support native ecosystems & wildlife.

Chapter 3 Questions - Driving gross emissions reductions through the NZ ETS

1. **Question: Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.**

United Fresh partially agrees with the case presented. The NZ ETS is a useful tool in driving net emissions reductions at present, and could be a useful tool in reducing gross emissions in the future, if structured properly. However, as noted in the Discussion Document, this would need to be a part of a "portfolio approach", and cannot be relied on as an individual tool by itself, or as a primary driver.

The NZ ETS is a "reactive" system, in that it only considers and acts on emissions, once they have occurred, by charging for the emissions via New Zealand Units (NZUs). This pricing is reflective not of the "true costs" of the emissions, but of the regulated market for these credits. As such, this is a system that only indirectly encourages reductions.

What United Fresh suggests is needed are direct "pre-emission" policies, regulations, and systems that support the development and implementation of lower emissions, by focusing not on the individual emissions, but on the present system that does not sufficiently encourage a transition to a low emissions economy, but instead relies on mitigation over prevention.

2. **Question: Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?**

United Fresh does not fully agree with the proposed impacts.

Our reason for not fully agreeing with your assessment of the cost impacts of a higher emissions prices relates to the issues of emissions leakage and the cost of energy from a holistic perspective.

Regarding the issue of emissions leakage, United Fresh notes that the current system does not adequately address this issue either, as this emissions leakage relates to emissions in countries outside of New Zealand's ability to legislate or regulate their direct emissions. However, it is still possible to indirectly regulate these emissions that relate to goods & services that enter New Zealand, or by businesses registered in New Zealand, through other tools in the "portfolio approach" suggested in the document (e.g., via the requirement for carbon mitigation of imported products, or for requiring New Zealand companies to mitigate their scope 2/3 emissions). United Fresh therefore does not see any issue with emissions leakages which cannot be solved by other regulatory or legislative tools at the Government's discretion.

United Fresh agrees that the cost of energy may rise in the short to medium term. As noted in the discussion document, this should lead to a more carbon neutral energy sector in the medium to long-term.

However, the price increases discussed do not consider the holistic perspective of the overall market for fossil fuels. If NZU prices may rise on a per-unit basis, this will increase the per unit cost of fossil fuels (e.g., per kg LPG / L petrol / Ton of coal etc.). However, if this change in pricing encourages a decrease in the use of fossil fuels over the medium- to long-term, then the overall spend, both on an annual basis, and overall basis, of fossil fuels, will decrease. For example, an increase in prices of NZUs by 15% could result in a 5% increase in costs per Litre of fuel, which means in the short term that consumers pay 5% more for fuel. However, if this helps drive average fuel efficiency gains of greater than 5% after 1-2 years, then consumers will, on average, be paying less annually for fuel.

If the Government wishes to avoid increases in fossil fuel cost, due solely to changes in the NZ ETS, United Fresh suggests examining what tools are available which would directly prevent emissions, instead of mitigating or indirectly reducing emissions, as a partner to the NZ ETS, in order to more effectively drive emissions reductions.

3. Question: How important do you think it is that we maintain incentives for removals? Why?

United Fresh is of the view that, under the current system, it is important to maintain incentives for removals. Under a system consisting of the status quo plus a revised NZ ETS, this would still be an important aspect of the project, but should be placed below that of any aspect related to emissions prevention. New Zealand cannot afford to focus solely on mitigation, as this does not solve the core problem, and merely delays the point at which the system must change, while making the eventual change more painful, costly, and complex. Given this, while maintaining incentives for removals is important, mitigation should be a secondary consideration, for assisting in mitigating emissions which could not be prevented.

Chapter 4 Questions – Changes to the NZ ETS would be significant for Māori

United Fresh is not a Māori organisation, nor does it directly represent Māori interests. However, United Fresh's vision is to create a sustainable fresh fruit and vegetable industry for all New Zealand, including Māori.

We also understand that Government departments are expected to work under Treaty of Waitangi (te Tiriti) principles, with the practical implementation governed by both the Crown Engagement with Māori Framework (the "Framework"),[1] and the Guidelines for engagement with Māori (the "Guidelines"),[2] published by the Office for Māori Crown Relations.

We therefore understand that MfE intends to follow the Treaty Principles, implemented within the Framework and Guidelines, and have taken the Framework & Guidelines into consideration in our answers.

The lead author, Jacob Lawes, United Fresh's Projects Manager, who is Tangata Whenua, affiliated with Ngai Tahu, Ngai Taranaki, and Ngati Whatua O Kaipara, has answered these questions from a Māori perspective, and from within the scope of the Government complying with te Tiriti.

1. **Question: Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?**

United Fresh agrees that the strategic positions of Māori presented in this chapter are the general positions held by different Māori and Māori organisations.

2. **Question: What other interests do you think are important? What has been missed?**

In United Fresh's opinion, there are no Māori interest group who may have been missed in the Discussion Document that we can identify.

3. **Question: How should these interests be balanced against one another or prioritised, or both?**

Examining the interest groups identified by MfE in the Discussion Document, United Fresh suggests that the balancing of Māori interests needs to take place within the context of te Tiriti, and within the framework established by Te Arawhiti The Office for Māori Crown Relations.

Within this scope, United Fresh is of the view that to appropriately meet its obligations, the Government needs to consider the long-term impacts as a primary focus, as continuing the status quo, or making only minor changes, will not enable and/or improve kaitiakitanga, nor will it enable new long-term opportunities for Māori advancement.

[1] Te Arawhiti The Office for Māori Crown Relations (n.d). https://www.tearawhiti.govt.nz/assets/Tools-and-Resources/Crown-engagement-with-Maori-Framework.pdf
[2] Te Arawhiti The Office for Māori Crown Relations (2018). Guidelines for Engagement with Māori. https://tearawhiti.govt.nz/assets/Maori-Crown-Relations-Roopu/6b46d994f8/Engagement-Guidelines-1-Oct-18.pdf

United Fresh agrees with the statement made on Page 47 about forestry being important for incomes and livelihoods of Māori at present. However, United Fresh also recognises that climate change is likely to cause an increasing frequency of floods, storms, and other natural disasters, similar to Cyclone Gabrielle, that will cause significant harm to Māori, and Māori communities.

United Fresh notes that MfE in the Discussion Document recognises that not all Māori agree with the incentives for exotic forestry such as pine, and that MfE also recognises that this is at least in part driven by the current NZ ETS.

If the Government were to take a position that minimal changes should occur, in order to protect the current Māori exotic forestry industry, this would cause significant and ongoing detrimental effects. These would occur not only in restricting other opportunities for Māori around native afforestation and alternative income streams, but also fail to meet the Government's obligations around kaitiakitanga and preserving the ecosystem for future generations.

However, if taking a position that is focused on the future generations and the environment, United Fresh acknowledges that this would have an impact on those currently relying on exotic forestry, if the Government does not adequately develop a transition system that supports a transfer of livelihoods away from exotic forestry, and towards more long-term solutions.

United Fresh therefore suggests that the most appropriate method for balancing these differing positions should be on the basis of prioritising the long-term requirements of the future generations and the environment, and utilising other tools available to the Government outside of the NZ ETS to minimise the financial and livelihood impact on the segment of Māori who currently rely on exotic forestation.

4. Question: What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?

Under the Government developed Framework and Guidelines, the process for when:

> "Māori interests are significantly affected";

or,

> "Māori interests are overwhelming and compelling",

is that Government departments should use the engagement principles of "collaborate" and "co-design".[3]

Given the depths of the impacts to Māori interests discussed in the Discussion Document, United Fresh therefore sees the primary opportunity for Māori as being able to co-design the new NZ ETS, to meet the principles of te Tiriti, and that more effectively enables kaitiakitanga.

This would require the Government to ensure the appropriate depth of engagement is occurring, and that the government does not simply "consult". The Crown Engagement Framework considers "consulting" only appropriate for decisions that would have "minor" impacts on Māori, and to "consult" would therefore be a breach of the Framework.

United Fresh also sees secondary opportunities for Māori, that would occur following implementation of a new NZ ETS system. While not an exhaustive list, some opportunities noted include:

- A potential improvement in the balance of financial returns between exotic and native afforestation encouraging native afforestation and the consequent improvement in native biodiversity.
- Opportunities for domestically driven emissions reduction research & development, which presents job opportunities to Māori.

[3] Te Arawhiti The Office for Māori Crown Relations. https://www.tearawhiti.govt.nz/assets/Tools-and-Resources/Crown-engagement-with-Maori-Framework.pdf

- A shift in focus from short-term mitigation to long-term permanent prevention, which supports kaitiakitanga principles.
- A potential reduction in the intensity and frequency of climate change driven weather events, which would otherwise lead to additional property damage, injuries, and deaths in the Māori community.

Chapter 5 Questions – Objectives and assessment criteria

1. **Question: Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?**

United Fresh agrees that the primary objective of considering whether to prioritise gross emissions reduction is appropriate. As noted in our answers to prior questions (Chapter 1, Question 4, and Chapter 3, Questions 1 and 3), a focus on mitigation is essentially an "ambulance at the bottom of the cliff" approach. Preventing 100 tons of carbon emissions annually, as an example, would mean that over 25 years, 2,500 tons of carbon was not emitted, and did not need to be mitigated. By contrast, mitigating that 100 tons annually would require 25 sets of mitigation actions, and, at the conclusion of the 25-year period, still would not have solved the main issue – namely, that the emissions are still occurring…

However, United Fresh acknowledges that some emissions will not be able to be mitigated with current technology, or with technology that may exist several years into the future. United Fresh therefore accepts the need for removal activities to support the economic activities that result in these emissions, until such time as prevention of the emissions is possible.

2. **Question: Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?**

United Fresh partially agrees that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow.

Our partial agreement is not due to the fact that we disagree in any part with the objective stated, but rather that United Fresh does not see a focus on a single tool (the NZ ETS) to manage emissions as a workable strategy.

The NZ ETS is a tool that was developed for a certain purpose, and was reasonably effective at meeting the initial objectives placed on it. However, it was limited in its scope of what it did, to focusing on the NZUs, and, as the name suggests, acting as a trading scheme for emissions credits.

Even with significant revision, at its core, the NZ ETS will still be a trading scheme for emissions credits, regardless of what type of credits exist, how they are generated or surrendered, and in what capacities they are required. And, while the scope of the NZ ETS can certainly be expanded, the more changes that are required, the more opportunities exist for the scheme to become less efficient, and more burdensome, with reduced effectiveness.

Building the objective around one singular tool, which is only designed around encouraging emissions mitigation and reductions via a market pricing tool is, in United Fresh's view, extremely unlikely to succeed.

However, a suite of purpose designed tools, that each work within their effective scopes, would offer a greater variety of opportunities to manage and reduce emissions, in an effective manner, which is a point raised and discussed in the Discussion Document.

Therefore, United Fresh suggests that the proposed objective should not just be a part of the NZ ETS, but be the primary objective of New Zealand's emissions reductions policy. Within this overarching policy, the NZ ETS would be but one implementation "tool" of a full "toolbox", each of which the Government uses in the relevant situations.

3. **Question: Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard-to-abate emissions in the longer term? Why/why not?**

United Fresh agrees that the NZ ETS should drive emissions removal, over the short term, so long as this is part of an overarching process that aims for improving the rate of carbon emission preventions to at least the NDC, which should be the Government's primary objective.

4. **Question: Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.**

United Fresh agrees with the primary assessment criteria and key considerations listed in the Discussion Document.

5. **Question: Are there any additional criteria or considerations that should be taken into account?**

United Fresh does not have any further considerations to suggest.

Chapter 6 Questions – Options identification and analysis

1. **Question: Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?**

United Fresh views the status quo, and Options 1 and 2, are wholly insufficient to meet the primary objectives.

United Fresh is of the view that Options 3 and 4 align the best with the primary objective. Of the two, Option 4 is significantly preferred, compared to Option 3.

2. **Question: Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.**

United Fresh will only comment here on Options 3 and 4, as United Fresh agrees with The Commission that Option 1 would be ineffective, and that there is insufficient evidence of the necessary overseas demand to support Option 2.

For Option 3, United Fresh agrees that the assessment of this option as having low support for removals is accurate, with regards to the way it is currently proposed. United Fresh is of the view that, with some tweaks to the design, it may be possible to increase the support for removals under Option 3, such as looking at phase-in/phase-out steps to ameliorate the issues described on page 63.

For Option 4, agrees that this Option would provide much greater control on pricing, and that this would take significant time to design and implement. However, United Fresh agrees with the assessment that this would provide a strong incentive for emissions reduction.

3. **Question: Of the four options proposed, which one do you prefer? Why?**

United Fresh is of the view that, given the points raised in the Discussion Document about the challenges inherent in Option 1 and 2, as well as the shortcomings of the status quo, these are not suitable for consideration.

Of Option 3 and Option 4, United Fresh is of the opinion that, if the Government intends to progress towards a Carbon Emissions future based around dealing with the issue, instead of "kicking the can down the road" with a focus on removals, that Option 4 is the most viable choice.

The current system is designed around emissions removal. Altering it under Option 3 to also support emissions reduction would be a viable pathway. This, in United Fresh's view, would be less effective than designing and implementing a system that is designed from the ground up around reductions as the primary objective, and having emissions removal as a secondary feature. This is what Option 4 would enable.

While United Fresh would accept Option 3 also being a decision that could be defended, it would not be the most appropriate decision, given the points discussed throughout the Discussion Document.

4. **Question: Are there any additional options that you believe the review should consider? Why?**

United Fresh is of the view that the review should consider ensuring that the change to the NZ ETS is accompanied by the development and implementation of supplementary tools, including policies/regulation/legislation where relevant, that complement the work of the revised NZ ETS, and which can incentivise emissions reductions in ways that cannot be appropriately encouraged via an NZ ETS.

5. **Question: Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?**

For Option 4, United Fresh is of the view that the policies required to support Option 4 are those explicitly discussed throughout the Discussion Document: policies that are not just focused on emissions removal, but those that encourage emissions prevention, both through the NZ ETS, and through other Government initiatives.

6. **Question: Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?**

United Fresh will only comment here on Options 3 and 4, as United Fresh agrees with The Commission that Option 1 would be ineffective, and that there is insufficient evidence of the necessary overseas demand to support Option 2.

United Fresh partially agrees that without the complementary policy interventions to support an appropriate transition, both Options 3 and 4 would have the discussed impacts on Māori.

However, United Fresh notes that the discussed negative impacts can be mitigated or completely prevented by the application of appropriate complementary policies.

Additionally, as discussed in our answer to Chapter 3, Question 2, United Fresh is of the view that the holistic long-term benefits are also not being fully considered – the long-term reduction in carbon emissions will result in Māori households paying less overall as businesses and services move away from carbon emitting systems, meaning a reduction of the impact of carbon pricing.

Finally, United Fresh notes that many forms of carbon or greenhouse gas emissions involve the emission of pollutants, such as particulates, sulphur, and other substances, many of which can cause or worsen health issues, especially those related to breathing. A reduction of our carbon emissions by switching away from carbon emitting technologies will also result in the reduction of the associated pollutants that are also produced, enabling indirect improvements in other environmental quality levels, as well as many common health concerns. This will result in improved kaitiakitanga indirectly, and for Māori to have improved future health outcomes.

Chapter 7 Questions – Broader environmental outcomes and removal activities

Within the answers to the questions of this chapter, we note that United Fresh is using the definition of "co-benefits" shown at the start of the entire Questions Section.

1. **Question: Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?**

Yes. The current situation incentivises primarily exotic forestry and disincentivises native forestry, due to their higher costs of planting and longer time to maturity. This is not a situation that can be corrected with market forces under the current NZ ETS design. To encourage native plantings that assist New Zealand in maintaining our biodiversity and native species will therefore require explicit policies that encourage native plantings as part of the new NZ ETS.

2. **Question: If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?**

United Fresh is of the opinion that Option 4 would give the greatest opportunities to support wider co-benefits, across the environmental, cultural, innovation, and economic spaces.

3. **Question: Should a wider range of removals be included in the NZ ETS? Why/Why not?**

United Fresh is of the opinion that other methods of removals (such as restoration of wetlands; additional removals in pre-1990 forests; and, increases in the storage of carbon in our soils, as suggested in the Discussion Document) could be considered for inclusion in the NZ ETS, but that systems would also need to be put in place, for if removal sources are subsequently depleted or removed (i.e., similar to how the NZ ETS has systems in place for when trees are removed).

4. **Question: What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?**

United Fresh is of the view that there are probably other ways that mechanisms could be implemented to reward the various environmental, social, cultural, economic, and health-related co-benefits for all New Zealanders, as well as for recognising other sources of removals.

United Fresh would however like to reiterate the position held throughout this response, that these mechanisms must be aligned into a single complementary framework, under which all carbon emission reduction and mitigation tools are grouped. These tools must also be designed in a cohesive manner that allows each tool to support the initiatives and outcomes of the other tools. Implementing any single initiative or tool (such as the revised NZ ETS) without ensuring it merges into a cohesive strategy, will only reduce its effectiveness, and increase the costs of implementation, resulting in worse outcomes, and taking longer to reach New Zealand's carbon targets. This would not be a desirable outcome.

Summary

Change happens in every generation. Some change is planned for, and some change is consequential. However, at the end of the day, the pan-produce industry supply chain represented by United Fresh, and the fresh produce industry businesses within this supply chain, play a significant part of getting food onto the nation's plates. Fruit and vegetables are healthy and nutritious, are wherever possible grown right here in New Zealand, and contribute substantially to achieving a sustainable food supply to the consumer, thus supporting New Zealand's food security requirements.

United Fresh agrees with the broad scope of New Zealand's efforts in reducing our emissions, and believes that the NZ ETS review will help New Zealand towards achieving the United Nations Sustainable Development Goals, which both the New Zealand Government, and United Fresh, have adopted.

United Fresh is of the view that a well-designed revised NZ ETS will be much more effective, efficient, and enduring than the current system, if it forms part of a wider framework with each individual regulatory tool designed to be targeted in scope and to form a holistic system. This would drive New Zealand towards the desired low carbon future.

United Fresh cautions against the more simplistic options proposed in the Discussion Paper. Applying the more simplistic options that only tweak the existing framework slightly, risks uneven and unexpected impacts across many industries, including the fresh produce sector.

Our industry is an extremely complex industry that covers the breadth of New Zealand. Our members operate both rurally, and throughout the urban areas of New Zealand. Our products cover a complex matrix of production factors and handling requirements, depending on the fruit or vegetable category, as some may be leaves, roots, fruits, or stems of the plant.

Our industry acknowledges that the production and supply chain of our fruits and vegetables creates greenhouse gas emissions. We understand that a paradigm shift will be required from our industry, in order to most effectively implement the required changes to reduce our emissions.

However, United Fresh is also of the view that there needs to be a paradigm shift in terms of how external parties view our fresh produce value chains. Fruit and vegetables grown in New Zealand can, at certain times of the year, be a significant part of a nutritional diet, for the tens of millions of consumers who purchase our product, both in New Zealand, and in our trading partner countries. And, when seasonality or growing conditions prevent New Zealand producers from being able to meet domestic demand, our industry imports certain fruits and vegetables from international sources, in order to ensure a nutritious balance of fruits and vegetables are always available.

Any new regulations or tools related to reducing greenhouse gas emissions that do not take into account the realities of maintaining our position of maintaining food security within New Zealand, and within our trading partners, could result in unintended consequences, which United Fresh has no wish to see.

United Fresh is available to provide further clarification, should MfE consider this to be of benefit.

Imported Motor Vehicle Industry Association

24 August 2023To: etsconsultation@mfe.govt.nz

Dear Sir/Madam,

RE: VIA's Response to the Review of the New Zealand Emissions Trading Scheme

VIA understands that the consultation period for providing feedback on the proposed Review of the New Zealand Emissions Trading Scheme has concluded. We apologise for this late submission, but we would appreciate our brief points below being noted by the officials working on the review.

VIA is the peak body for businesses involved in the sourcing, acquisition, distribution, and retailing of parallel imported motor vehicles in New Zealand. Our members deliver approximately the same volume of vehicles as the new car sector, with the added benefit that we can search out the best vehicles to meet the needs of average Kiwi families and small businesses from among a wide array of already proven vehicle technologies (including electrified, hybrid, and low emission).

VIA agrees that the evidence is clear: the best way to combat climate change is through the prevention of emissions. We were particularly interested to read some of the points in Chapters 3 and 5 of the discussion document.

We feel these points argue strongly for a single conclusion:

Assuming that behaviour changes are not desirable or possible, the facts are as follows:

- According to modelling, prevention of emissions is the strategy that results in best outcomes
- The sooner the prevention of emissions, the better the outcome
- Switching technology from fossil fuels to electric ("fuel switching") is the best way to prevent emissions

Considering these facts and as noted in the discussion document, the too slow uptake of technology that facilitates "fuel switching", the obvious conclusion is that the ETS should take a more active role in promoting that uptake.

The government should expand the ETS system to allow the awarding of carbon credits for technological solutions that directly prevent emission that would have otherwise been inevitable.

This would need to be done carefully with a focus on already committed emissions; it should not promote increased consumption or the commitment of additional emissions (embodied or otherwise).

We have no strong preference for the options listed in the discussion document, but we are less inclined to support those options that lead to increased complexity through the creation of multiple discrete markets.

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Phone: +64 (9) 573-3058
Web: https://www.via.org.nz/
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Technical Enquiries: technical@via.org.nz

We would be very interested in discussing this further with officials, including exploring concrete actions that our industry can take that would fall within the scope of the potential goals outlined in the discussion document.

Please feel free to contact us with any questions.

Sincerely,

Kit Wilkerson
VIA Head of Policy and Strategy
[redacted]

About us: VIA is the business association that represents the interests of all businesses involved in importing, preparing, wholesaling, and retailing most used vehicles that are imported into New Zealand from Japan, UK, and other source markets.

VIA members include registered traders, importers and wholesalers, Japanese auction companies and exporters, shipping companies, NZ Government-accredited inspection agencies, ports, compliance shops and other service providers to the trade.

VIA acknowledges the evidence of climate change and the present and future risks that it presents for New Zealand and for our industry. We worked closely and collaboratively with the Ministry of Transport on the design and implementation of the Clean Car Programme to assure it would work for the New Zealand context. We will continue to work closely with government to be part of the solution to the challenges of our future.

Privacy Statement: VIA has no concerns about this submission being made available to the public.

Westpac New Zealand Limited and Westpac Banking Corporation (NZ Branch)

Submission to

the Ministry for the Environment on

The Review of the New Zealand Emissions Trading Scheme

11 August 2023

1. INTRODUCTION

1.1 This submission to the Ministry for the Environment (the **Ministry**) is made on behalf of Westpac New Zealand Limited (**WNZL**) and Westpac Banking Corporation (New Zealand Branch) (**WBC NZ Branch**) (together, **Westpac**) in respect of the Review of the New Zealand Emissions Trading Scheme (**Consultation Paper**). Thank you for the opportunity to provide feedback on the Consultation Paper.

1.2 Westpac welcomes the review of the New Zealand Emissions Trading Scheme (**NZ ETS**) and considers that it is timely and needed to support and incentivise gross emissions reductions. Westpac recognises that the NZ ETS plays a key role in New Zealand's response to address the significant effects of climate change.

1.3 Westpac's contact for this submission is provided separately.

2. KEY SUBMISSIONS

2.1 Westpac makes the following key submissions:

(a) Consistent with scientific consensus, Westpac supports the proposition that the primary focus of the NZ ETS should be on gross reductions.

(b) Further detail and more robust cost-benefit analysis (such as comprehensive modelling data) is needed in respect of each of the proposed options, to allow for meaningful consideration of the short-term, medium-term and long-term impacts of each option.

(c) Westpac recommends that the Ministry provides a fully articulated view on the intended balance between gross emissions reductions and net removals including a cost-benefit analysis that takes into account social, environmental and economic impacts.

(d) Westpac recommends that the Ministry considers the role of complementary policies, strategies and actions that are needed outside the NZ ETS to achieve climate targets, manage impacts and assist with a just transition, taking into account the longer-term view of Te Ao Māori.

(e) Westpac asks the Ministry to provide urgent clarity with regards to the grandfathering of existing commercial arrangements backed by NZUs, existing forests registered in the NZ ETS and registry holdings of NZUs, should major changes be made to the scheme.

3. SUMMARY OF POSITION

3.1 Westpac agrees that the NZ ETS should provide robust support for greater emissions reductions, to ensure that New Zealand is on track to meet its climate targets and contribute to global efforts. Westpac is committed to this objective.

3.2 Westpac agrees that a strong price signal delivered through the NZ ETS is fundamental to achieving this objective and reducing New Zealand's gross emissions. While a focus on net emissions reductions may meet New Zealand's Nationally Determined Contribution (**NDC**) targets, it is less

effective in assisting the transition to a low carbon economy, which requires significant gross emissions reductions. Delays to New Zealand's acceptance of the need to reduce gross emissions is likely to increase the overall cost of the economy's low carbon transition by potentially introducing the need for more rapid change at a later date, with the associated uncertainties and disruption.

3.3 Westpac considers that achieving the appropriate balance between gross emissions reductions and net removals requires a robust, science-based analytical framework which takes into account the contribution of emissions reductions and removals to reach the desired objective. To this end, Westpac considers that there should be a fully articulated Government view on the intended balance between gross emissions reductions and removals.

3.4 There is currently insufficient detail and analysis on the proposed draft assessment criteria and the proposed options to allow for an informed comparison and assessment with regards to the resulting impacts of each of these. Based on the limited data available, Westpac considers that it is not able to expressly endorse one of the proposed options (but this should not be taken to mean that it dismisses all the options proposed). As such, Westpac recommends that the primary assessment criteria are further developed, additional detail is provided, and robust analysis is carried out by the Ministry in respect of the proposed options.

3.5 Westpac asks that the Ministry provides urgent clarity with regards to the grandfathering of existing commercial arrangements backed by NZUs, existing forests registered in the NZ ETS and registry holdings of NZUs, to alleviate the current investor uncertainty and to restore confidence to the market. Westpac believes that a loss of trust and confidence in the NZ ETS would result if existing participants' rights were not protected, and abrupt changes were applied without appropriate grandfathering provisions in place to allow time for participants to review their respective positions. In particular, in this context, Iwi could be disproportionately impacted through the value of their relatively high volumes of exotic forestry investments, which were made in good faith at the time.

3.6 Westpac acknowledges and supports the role of complementary policies, strategies and actions outside the NZ ETS (such as those outlined in the wider Emissions Reduction Plan) to reduce barriers to action where possible, such as making available further GIDI funding to assist industry decarbonisation, supporting investment in enabling infrastructure (e.g. EV charging) and continuing to provide funding for research and development in decarbonisation technologies (e.g. agriculture).

4. RESPONSE TO CONSULTATION QUESTIONS

Question 2.1: Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term.

4.1 We agree with the analysis that we can use a combination of gross emissions reductions and afforestation to drive net emissions reductions, particularly in the short-term. We acknowledge that forestry removals contribute to meeting our net emissions reduction target in New Zealand's NDC and recognise New Zealand's comparative advantage in deploying afforestation to absorb carbon. However, in all time periods, it is critical that gross emissions reductions are the primary goal as overreliance on sequestration is inconsistent with the goal of keeping global warming to 1.5 degrees Celsius above pre-industrial levels. Sequestration from exotic forestry does not provide a permanent carbon sink and is, therefore, an interim measure that supplements the primary objective of cutting gross emissions.

Question 2.2: Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?

4.2 WBC NZ Branch has been a major intermediary in the NZ ETS secondary market since early 2010. WBC NZ Branch provides liquidity in the spot market and offers risk management solutions to enable gross emitters to manage multiyear procurement and price risk.

4.3 Many large gross emitters have significant annual surrender liabilities and will manage this risk through a treasury or trading team in line with their treasury policies. The introduction of NZ ETS auctions has provided gross emitters access to liquidity four times a year which may have otherwise been difficult to obtain easily in the secondary market. Many emitters hold a view on where NZU prices should be as well as a future expectation that these prices are likely to increase. As such, the NZ ETS auctions have enabled gross emitters to hedge multiyear risk within treasury policies. This helps provide certainty in budgets, forecasting and cash flows and investment decisions.

4.4 As part of a portfolio approach of managing surrender obligations, we are aware of gross emitters investing directly in afforestation projects for carbon, generated through forestry removals.

4.5 We are aware (based on anecdotal evidence and our lending activities) that many large emitters are investing in low emissions alternatives such as renewable electricity generation and capturing and flaring gas in landfills. However, many sectors who participate in the NZ ETS have long-term assets, and long-term journeys towards a lower emissions future. As such, policy certainty is required to enable significant and long-term investment decisions.

Question 2.3: Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?

4.6 We regularly speak to many forestry consultants, forestry NZ ETS participants and WNZL Agri or forestry customers with respect to the NZ ETS. Based on these conversations, we understand that the price signal delivered through the NZ ETS has resulted in significant land use change, namely the loss of productive pastoral land to forestry and impacted land prices as landowners weigh up the attractiveness of different land use options.

4.7 With the recent fall in NZU prices and general uncertainty as to the potential reform of the NZ ETS, we understand that a significant amount of investment and planting plans have been put on hold (as a result of this uncertainty).

4.8 It is worth noting that there are certain barriers to viable commercial opportunities for land that is unsuitable for other productive uses or difficult to actively farm due to specific governance arrangements (for example diversified ownership with respect to Iwi-owned land). Afforestation can provide a viable pathway for Iwi to unlock the financial potential of such land which would otherwise be difficult to do.

Question 2.4: Do you agree with the summary of the impacts of exotic afforestation? Why/why not?

4.9 Yes. We agree that the ability to offset 100% of emissions at source with exotic forests has incentivised the planting of pine trees, and that has led to changes in land use. Furthermore, given current NZ ETS settings, this is likely to remain the case for the foreseeable future as emitters continue to opt for least cost options to meet their obligations under the NZ ETS.

4.10 We also agree that there is a limit to the benefit that can be derived from afforestation but believe that its use can buy valuable time as gross emissions reductions accelerate and new technologies that reduce emissions can be deployed at scale.

4.11 We note that there has been a significant increase in exotic forestry plantation since 2019. Our view is that current and future negative environmental and social externalities associated with exotic afforestation (such as productive land use change, supply of farmland, forestry slash, ecological damage, loss of biodiversity and social impact concerns, including a potentially disproportionate impact on Māori communities) should be addressed by targeted regulatory interventions that lie outside of the NZ ETS.

Question 3.1: Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.

4.12 Yes, we agree that the NZ ETS should be one of the main tools for driving gross emissions reductions. Complementary policies, strategies and actions will be needed outside the NZ ETS (such as those outlined in the wider Emissions Reduction Plan) as well as removal of barriers where possible, such as through making available further GIDI funding to assist industry decarbonisation, supporting investment in enabling infrastructure (e.g. EV charging) and continuing to provide funding for research and development in decarbonisation technologies (e.g. agriculture).

4.13 The NZ ETS provides a powerful market-based solution to incentivise desired behaviours. It is accepted as being robust, trusted and reasonably mature. It creates a relatively fast and transparent transfer of cost to emitters. If gross emissions reductions are not driven by the NZ ETS, then in our experience, the focus switches to the lowest cost to offset which in the absence of other policy measures, leads to potentially unintended outcomes (such as increased exotic afforestation and its documented downstream impacts). While this may assist in meeting New Zealand's NDC targets, it does little to assist the long-term transition to a low carbon economy. Delaying gross emissions reductions would likely lead to an increase in the overall cost of the economy's low carbon transition given New Zealand would instead need to reduce emissions more rapidly at a later date.

4.14 However, we do believe that the case for driving gross emissions reductions through the NZ ETS could be more clearly articulated and the cost-benefit trade-offs of a net versus gross emissions objective be undertaken before any further development of the reform options for the NZ ETS is carried out.

4.15 In this context, we do recognise the role that exotic afforestation can play as a supplementary measure, due to its capacity to absorb significant CO2 emissions from the atmosphere over a comparatively short period. In doing so, it helps address the need to urgently decrease GHG concentrations in the atmosphere, while gross emissions reductions accelerate.

4.16 To determine the ideal balance between gross reductions and sequestration, we suggest that there is development of an analytical, science-based framework that clearly specifies the goal that it wishes to achieve and the medium-term objectives that must be reached to address and meet that goal. It can then assess the contribution of various combinations of reducing emissions at source and offsets (such as forestry) to achieve the desired outcome. This framework will also need to take into account the relative cost-benefit analysis of each of these combinations (including the potential for unintended social and / or environmental impacts).

Question 3.2: Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?

4.17 Emissions pricing is designed to incentivise change though a clear and strong price signal. We agree that a stronger focus on gross emissions reductions would result in a higher NZU price. Because of this, it is inevitable that a higher emissions price will impact consumers and households. Where possible, consumers and households may need to change how they consume and behave, which may ultimately help drive gross emitter behaviour. However, we acknowledge that individual consumers will face different choices and opportunities to reduce emissions, depending on their circumstances (e.g. in the face of higher overall electricity prices).

4.18 We agree that some households will be impacted more than others through higher emissions prices. To this end, we recognise that there may be a need for further targeted policy from the Government outside the NZ ETS to address the regressive effects of higher emissions prices on certain households and communities as part of the wider Emissions Reduction Plan and ensuring a just transition.

4.19 The counterfactual should also be considered, which is that failing to incentivise gross emissions reductions is likely to have a longer-term impact on consumers in terms of price instability if New Zealand does not decarbonise in line with other countries, for example by exposure to international oil prices.

Question 3.3: How important do you think it is that we maintain incentives for removals? Why?

4.20 The role of removals is important for New Zealand meeting its domestic and international climate change goals. We believe that forestry offsets have a part to play if New Zealand is to reach its emissions reductions targets, particularly in the short-term. We consider that our international and domestic emissions targets, both of which are expressed in net terms, are achievable through a combination of decarbonisation and forestry offsets, with respective weightings changing over time. The appropriate balance could be assessed through an analytical, science-based framework (referred to in our response to question 3.1).

4.21 We would note, however, that the net nature of our NDC targets has been subject to international criticism, and that New Zealand is required under the Paris Agreement to update its NDC targets every five years (the next update due in 2025). As such, we would caution an overreliance within the NZ ETS on removals in the medium and long-term, except for hard to abate sectors which do not have the option to rapidly decarbonise.

4.22 Policy settings, whether it be for exotic or indigenous forests, wetlands or other forms of removals, and alternative programmes such as a voluntary carbon market or biodiversity credits, should be set to drive the desired outcomes and provide long-term investment certainty where needed. Westpac considers that Māori and Iwi perspectives should be considered in relation to indigenous forest programmes or biodiversity credits, should they eventuate.

4.23 We believe in the need to balance the different benefits and attributes between native and exotic forestry, noting the differences in sequestration profiles, exposure to physical risks and wider social and environmental impacts. While in principle, we consider that the contribution of native forests in respect of reducing emissions should be market driven, additional policy and legislative measures outside of the NZ ETS may be required to account for other benefits.

4.24 We would support the development of a national sequestration strategy that identifies opportunities for nature-based sequestration, assesses alternative uses of resources, and balances choices against the need to value and protect Aotearoa's natural capital. This strategy should then underpin the choice of the policy instrument to reward these activities.

Question 4.1: Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?

4.25 We agree with the Consultation Paper's description, noting that there are a diverse range of interests and views on forestry outcomes amongst Māori.

4.26 On the one hand, some landowners have chosen to keep their land planted in indigenous forests and we encourage the Ministry to treat these landowners with fairness and recognise the value of their contribution to maintaining biodiversity. Consideration needs to be given to how such landowners can access longer term funding to match the intergenerational investment which has been made and will be made in these forests.

4.27 On the other hand, some landowners are able to gain revenue from exotic plantations on otherwise unproductive land. We note that a high proportion of land restored to Māori ownership through *Te Tiriti o Waitangi* settlements is situated on marginal land and therefore was not highly productive or profitable before entering into the NZ ETS. Accordingly, any proposed reforms to the NZ ETS should take into account the potential disproportionate impact of such reform on these landowners.

4.28 We believe that a holistic, system-wide approach which incorporates the longer-term view of Te Ao Māori is needed to achieve a desired and balanced outcome for Māori.

Question 5.1: Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?

4.29 Yes. We believe that New Zealand needs to prioritise gross emissions reductions to:

(a) reflect scientific consensus;

(b) address concerns over New Zealand's reliance on afforestation; and

(c) ensure that emissions reductions are not left to future generations.

4.30 We also note that prioritising gross emissions is consistent with the Intergovernmental Panel on Climate Change's models that prioritise reductions before using forestry or technology to remove residual emissions. This approach is also in line with Toitū Envirocare's framework (based on the Science Based Targets initiative) which Westpac is committed to as part of the Toitū net carbon-zero programme.

Question 5.2: Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?

4.31 We agree that the NZ ETS should encourage gross emissions reductions via rapid deployment of known and available technology at scale which, in our view, is required to achieve significant gross emissions reductions. In addition, the NZ ETS should be encouraging the uptake of any new and emerging technology as it becomes available. We do, however, acknowledge that there needs to be

consideration of the costs of these technologies, and the flow on impact to communities and households. As noted earlier, complementary and targeted policies may be needed to address negative social externalities associated with such higher costs.

Question 5.3: Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard to-abate emissions in the longer term? Why/why not?

4.32 As noted in our response to question 3.3, the role of removals is important for New Zealand in meeting its domestic and international climate change goals, particularly in the short-term. Westpac recognises that there are some industries (aviation in particular) which will be hard to abate and may require a continued reliance on removals in the medium and longer term.

4.33 In the longer term, for hard to abate sectors where technology still does not exist or is not financially viable, Westpac considers that it will be important for the long-term nature of any residual emissions to be matched with a long-term removal solution (e.g., preferably native afforestation rather than exotic, or permanent carbon capture and storage).

Question 5.4: Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.

4.34 We don't consider that the set of primary criteria proposed have been sufficiently developed to ensure an orderly transition of focus from net to gross emissions. We think that additional criteria should be developed and used to assess each of the options proposed by the Ministry.

4.35 Accordingly, it is difficult to assess the options against the primary assessment criteria given the lack of detail that is provided (including a lack of detail around the proposed NZ ETS settings). Westpac has developed an additional set of criteria which we think are appropriate to consider – these are explained in the response to question 5.5, below.

4.36 In terms of the key considerations outlined, if the NZ ETS is going to be one of the main tools to drive gross emissions reduction levels, then we believe that the most important consideration should be '*Affects the functionality of the NZ ETS market*.' If the NZ ETS market is functioning effectively, it should support meeting New Zealand's NDC and support co-benefits. If there are problems with the functionality of the NZ ETS, it is likely that all other considerations will also be impacted.

Question 5.5: Are there any additional criteria or considerations that should be taken into account?

Grandfathering

4.37 Significant consideration should be given to grandfathering of existing commercial arrangements when assessing various options in this consultation. Some of the proposed options have the potential to have significant consequences for participants across all sectors in the NZ ETS, as well as intermediaries and banks.

4.38 There are a broad range of commercial arrangements that various participants have entered into and need to be considered from a grandfathering perspective. Some of those considerations include (but not necessarily limited to) the following:

(a) Long-term offtake agreements between foresters and emitters, some of which may run for 10-15 years plus.

(b) Long-term forward contracts that financial intermediaries have entered into with foresters and emitters, again these will go out multiple years.

(c) Under option 4, clarity is needed around the treatment of stockpiles held by participants if there is a change to a gross and / or removal units. For instance, will NZUs held for future surrender obligations be able to be used?

(d) The financial impact could be significant for many stakeholders if existing NZUs are reclassified or existing forestry units trade at a discount to other units.

(e) With NZUs possibly being discounted or removed from the NZ ETS completely (into a 'removals market'), options 3 and 4 potentially have considerable impact on bank lending agreements and lending metrics against afforestation with security against NZUs and / or debt serviceability depending on the price of carbon.

(f) Landowners and foresters have made significant investments in forests along with some emitters. Clarity is needed as to whether these arrangements will be grandfathered.

4.39 We believe that a loss of trust and confidence in the NZ ETS would result if existing participants' rights were not protected, and abrupt changes were applied without appropriate grandfathering provisions in place to allow time for participants to review their respective positions. Abrupt changes and the lack of protection of incumbent investors will result in ongoing nervousness about the robustness and predictability of the NZ ETS and its currently understood purpose and function.

4.40 In particular, we note that Iwi could be disproportionately impacted through the value of their relatively high volumes of exotic forestry investments, which were made in good faith at the time, if the rules on existing positions are changed abruptly and without grandfathering provisions in place.

4.41 We note that there is currently considerable uncertainty in the NZ ETS market as a result of the Consultation Paper as well as the upcoming general election. Clarity around grandfathering treatment of existing arrangements would alleviate this uncertainty to some degree, especially around option 4 (which, in our view, represents the most significant structural change to the NZ ETS and as a result, significant impact on participants).

4.42 Aside from grandfathering, additional consideration should be given to the impact of possible NZ ETS changes on these types of agreements and arrangements in the future. The ability for participants to allocate and manage various risks is extremely important whether that be bilaterally or through the NZ ETS secondary market, or both.

Additional Criteria

4.43 We believe that in order to robustly assess the merits of each of the four options proposed, the following additional criteria should be considered:

(a) **The role of government should be minimised**. The Ministry should set the rules of the scheme and then leave economic actors and markets to price and allocate resources and risks.

(b) **The ETS should deliver the required decarbonisation adjustment in a timely and cost-efficient manner.** This is key to meeting our international commitments, preserving competitiveness of our trade-exposed industries while maintaining the living standards and

wellbeing of New Zealanders now and in the future. Costly and risky outcomes, including overreliance on future technologies, should be avoided.

(c) **The system should be flexible and resilient to change**. The structure of the domestic and global economy will change in the decades ahead and the NZ ETS should have sufficient flexibility to adjust, and facilitate/encourage sectors to adjust, in a timely fashion. Technological change is likely to be immense in the coming decades as the globe grapples with this existential crisis. The NZ ETS should be able to adapt to that (for example as cost-effective carbon saving technologies become available). Consideration should also be given to the potential of other sequestration opportunities.

(d) **Social impacts and disruption should be managed by targeted complementary policies**. In our view, we recognise that there are likely to be social impacts resulting from the transition. As noted above, there should be wider support to assist with these disruptions, in the form of targeted, complementary policies.

Question 6.1: Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?

4.44 We note that there is currently insufficient detail, modelling, data or analysis in the Consultation Paper to allow for an assessment of which of the proposed options best aligns with the primary objective of prioritising gross emissions reductions while maintaining support for removals. Such modelling and analysis should include an assessment of the costs, benefits and expected price impacts associated with each of the proposed options.

4.45 However, we note that on the face of it, options 3 and 4 are likely to introduce further complexity. Further complexity may have an adverse impact on market participation efficiency and liquidity. The NZ ETS is comparatively small in terms of the number of participants and turn over and can be very illiquid. Whilst a separation in pricing may be needed to drive the right outcomes in removals (depending on removal type), this could further fragment the market and negatively impact its efficiency and liquidity.

4.46 Additionally, consideration would need to be given as to whether the introduction of a separate removals and compliance market under option 4 would, in practice, constitute an abandonment of the NZ ETS. Clarity is also needed with respect to how the price setting mechanism would work for removals under this option.

Question 6.2: Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.

4.47 Please see our response to question 6.1 above.

Question 6.3: Of the four options proposed, which one do you prefer? Why?

4.48 Please see our response to question 6.1 above.

Question 6.4: Are there any additional options that you believe the review should consider? Why?

4.49 Please see our response to question 6.1 above.

Question 6.5: Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?

4.50 As explained above, we do not have a preferred option for the reasons outlined in our response to question 6.1. However, we believe that concerns related to externalities associated with afforestation and inappropriate land use outcomes can be dealt with outside the NZ ETS through targeted complementary policies (for example implementing changes to the consenting rules). This would then ensure that the NZ ETS is focused on its role of delivering a carbon price consistent with New Zealand meeting its emissions targets.

Question 7.1: Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?

4.51 Broadly, we are in favour of supporting native afforestation with environmental co-benefits. However, we believe that further analysis is needed to better understand how this can be promoted whilst maintaining the operation of the NZ ETS in its most efficient and simplest form. Westpac considers that Māori and Iwi perspectives should be considered in relation to indigenous forests and environmental, and cultural, co-benefits.

Question 7.3: Should a wider range of removals be included in the NZ ETS? Why/Why not?

4.52 We acknowledge the importance of removal activities with environmental co-benefits such as indigenous afforestation. We also agree with some of the challenges noted in chapter 7 of the Consultation Paper in respect of the commercial viability of many of these investments at current carbon price levels, or other challenges around low sequestration quantities of areas such as riparian margins. The implications of adding removal activities on current and future NDCs will also need to be carefully considered.

4.53 With respect to the work programme noted on page 74 of the Consultation Paper around complementary measures that support a wider range of removal activities through the Carbon Removals Strategy, we believe this piece of work should be completed first with a decision then to be made on whether to introduce this policy through a pricing tool (such as the NZ ETS) or via external policy mechanisms, or a mix of both.

4.54 Furthermore, and as noted earlier, consideration also needs to be given to the fragmentary impact of adding different types of removals to an already small and illiquid ETS market.

Question 7.4: What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?

4.55 We would suggest that land use rules and biodiversity regulations could be better employed to reward such co-benefits.

4.56 We also note that voluntary markets may provide financial incentives for co-benefits that cannot be effectively accounted for in the NZ ETS.

4.57 Westpac considers that Māori and Iwi perspectives should be considered in relation to environmental, and cultural, co-benefits of other sources of removals and any biodiversity credits or market.

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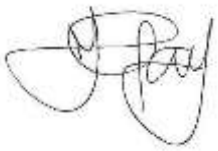
Tēnā koe,

Waikato Regional Council Submission on the review of the New Zealand Emissions Trading Scheme (NZ ETS) and proposals to redesign the NZ ETS Permanent Forest Category

Thank you for the opportunity to submit on the review of the New Zealand Emissions Trading Scheme (NZ ETS) and proposals to redesign the NZ ETS Permanent Forest Category. Please find attached the Waikato Regional Council's (the council's) submission, endorsed by the Submissions Subcommittee under delegated authority on **2 August 2023**.

Should you have any queries regarding the content of this document please contact Annika Hamilton, Policy Advisor, Policy Implementation directly on [redacted] or by email [redacted].

Regards,



Tracey May
Director Science, Policy and Information

Submission from Waikato Regional Council on the review of the New Zealand Emissions Trading Scheme (NZ ETS) and proposals to redesign the NZ ETS Permanent Forest Category

Introduction

1. We appreciate the opportunity to make a submission on the review of the New Zealand Emissions Trading Scheme (NZ ETS) and proposals to redesign the permanent forest category.

2. We recognise the importance of climate action in the current global and national setting and highlight that as a local government authority, many of our activities are impacted by climate change. This is particularly important given our role managing activities that contribute to the emission of greenhouse gases. The council also shares the view that well-informed policies and strategies are necessary to ensure that the country will meet the national targets set under the Climate Change Response Act 2002.

3. This submission covers two consultations: the review of the NZ ETS and the proposed redesign of the permanent forest category. We recognise that these topics are inter-linked and therefore our responses apply to both consultations.

4. For ease of reference, we have structured the submission following the chapters and questions in each discussion document. Our comments are in the attached table and we wish to highlight the following points:

Review of the New Zealand Emissions Trading Scheme

4.1. We support a review of the NZ ETS as recommended by the Climate Change Commission (the commission). The NZ ETS is a key tool in Aotearoa's response to climate change. We support options that will create separate incentives for gross emissions reductions and emissions removals.

4.2. We note option four would create two separate NZ ETS markets with separate prices. We consider this option would drive emission reductions as emitters would not be able to use forestry NZUs to pay for their emissions. We also prefer this option because it also allows the government to incentivise reductions and removals.

4.3. Our submission also advocates for the government to follow the commission's advice on price control settings. However, we note that since the submission was written, the government has announced new limits and price settings that are in line with the commission's advice. We therefore acknowledge that this submission point has now been addressed.

4.4. We consider the NZ ETS should incentivise removals with environmental co-benefits. We support the government's recent announcement signalling a reform to the NZ ETS to recognise all forms of carbon sinks, including wetlands.

4.5. We note that the NZ ETS has a direct impact on land use in the Waikato Region and caution against the unintended negative consequences associated with widespread exotic afforestation. The Waikato Regional Council does not advocate for one land use activity over another, such as the wholesale replacement of agricultural activities with forestry, rather it is supportive of both farming and forestry continuing in a sustainable manner where appropriate land is used to adjust to climate change impact.

4.6. We highlight the need for close collaboration between the forestry industry, central government, and local government to address infrastructure challenges. In the case of land use changes from

farming to forestry, the infrastructure will need to be reviewed and possibly retrofitted and this may increase costs for local authorities and rate payers.

Redesign of the permanent forest category in the NZ ETS

4.7. We support a redesign of the permanent forest category that will benefit indigenous afforestation and indigenous biodiversity. We advocate for a fit for purpose approach that encourages having the right tree in the right place for the right purpose.

4.8. If exotic forests are allowed under limited circumstances, we advocate for an approach that is guided by the objective to mitigate any significant environmental, economic and social consequences associated with large-scale permanent exotic afforestation. For example, approaches that discourage monocultures.

4.9. Finally, we strongly advocate for the government to provide certainty for the future system. Market participants need to plan tree life cycles and a stable market will provide greater incentives for GHG emitters to invest in emission reduction technology.

5. We look forward to future consultation process to incorporate the proposed amendments into relevant statutes and would welcome the opportunity to comment on any issues explored during their development.

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SUBMISSION ON THE REVIEW OF THE NZ ETS AND PROPOSALS TO REDESIGN THE NZ ETS PERMANENT FOREST CATEGORY

Review of the NZ ETS

Questions	WRC response
Chapter 2: Expected impact of the current NZ ETS	
2.1 Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?	We agree that the NZ ETS will drive short-term reductions, but we do not consider the NZ ETS (in its current form) will drive reductions in the medium and long term. We refer to the commission's advice that the current structure of the NZ ETS is likely to result in extensive afforestation, allowing gross emissions to continue largely unabated. We recognise the NZ ETS is a key tool for addressing climate change in Aotearoa, however, it has not been allowed to act as an effective pricing mechanism. In particular, the price for the cost containment reserve has been kept lower than the commission recommended. This has limited the effectiveness of the mechanism to send a clear price signal. We strongly advocate for the government to follow the advice of the commission and provide certainty for the future system and price settings. Market participants need certainty to plan tree life cycles and a stable market will provide greater incentive for GHG emitters to invest in emission reduction technology.
2.2 Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?	See response to question 2.3 below.
2.3 Do you have any evidence you can share about landowner and forest investment behaviour in response to NZU prices?	Our records on land use patterns suggest the NZU price has influenced land use behaviour in the Waikato Region. Between 2001 and 2008, approximately 21,000ha of production forests were cleared and converted to pasture in the region. This was in response to the relative price of dairy products compared to forest products. However, when the NZ ETS came into effect in 2008, clearance halted because it placed a price restraint on felling plantation forests that were not replanted as part of a planned rotation. When the new government introduced changes to the NZ ETS through the Climate Change (moderated emissions trading) Amendment Act in 2009, the price of NZUs dropped, effectively removing the financial impediment to deforestation. As a result, between 2008 to 2012, there was approximately 23,000ha of land converted from pine to pasture in the upper Waikato Catchment. This illustrates a strong correlation between NZU prices and land use patterns.
2.4 Do you agree with the summary of the impacts of exotic afforestation? Why/why not?	We agree with the impacts of exotic afforestation detailed in the consultation document and we caution against the negative unintended consequences. We consider that widespread exotic afforestation could displace productive land use, impact economic and employment opportunities, and result in the potential uncontrolled spread of exotic trees in areas surrounding permanent forests planted with seeding species.

Questions	WRC response
	We also note that the discussion document does not detail the impacts of widespread exotic forestry on infrastructure. For example, forestry could potentially have higher impacts on the roading network compared with other land use (despite lower frequency/use). There also needs to be more consideration of transport routes and transport options with regard to reducing GHG emissions from transport associated with forestry. Extensive afforestation will also impact water takes.
Chapter 3: Driving gross emissions reductions through the NZ ETS	
3.1 Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.	Yes, we agree with the case for driving gross emissions reductions through the NZ ETS and acknowledge that it is a key tool for assisting Aotearoa New Zealand to meet its emissions budgets, 2050 target and Nationally Determined Contributions. However, we advocate for the government to follow the commission's advice on price settings to ensure the NZ ETS can operate effectively and so that we don't become over reliant on complementary policies.
3.2 Do you agree with our assessment of the cost impacts of a higher emissions price? Why/why not?	We consider the assessment presupposes that the costs of NZUs for the energy sector will simply be passed on to households. Whilst we recognise that there may be a period of transition, the NZ ETS should occasion behaviour that will reduce costs for households in the long-term. We refer to the commission's draft advice where it states that increasing the speed of decarbonisation will likely save costs in the long run, particularly with regard to transport, space and water heating and process heat.[1] The cost impacts of higher emission prices can also be addressed through complementary policies and do not necessarily need to be mitigated directly through carbon pricing. We acknowledge the assessment that a higher emissions price could result in emissions leakage and that offset options need to remain available for hard-to-abate emissions.
3.3 How important do you think it is that we maintain incentives for removals? Why?	We consider it will be important to maintain incentives for removal activities, including coupling incentives for removals with co-benefits. Incentives could be broadened to cover other types of removal activities through careful consideration. We support developing methods for tracking emissions and removals by sources and sinks not yet included in the country's domestic or international target accounting, such as soils and biomass. We also recommend incentives for indigenous planting that will ultimately enhance eco-systems.

[1] CCC4940_Draft-ERP-Advice-2023-P02-V02-web.pdf (climatecommission.govt.nz)

Questions	WRC response
	However, we recognise these incentives don't all need to come through the NZ ETS and can be achieved through complementary policies and mechanisms. We note the government is exploring whether a biodiversity credit system could help to incentivise the protection and restoration of native wildlife in Aotearoa. This could be used as a mechanism outside the NZ ETS to support the protection or re-establishment of forests.[2] Costa Rica is an example of how incentives have driven compliance and forest conservation. Payments for emission reductions helped the country achieve its environmental accomplishments.[3]
Chapter 4: Changes to the NZ ETS would be significant for Māori	
4.1 Do you agree with the description of the different interests Māori have in the NZ ETS review? Why/why not?	We acknowledge the different interests Māori may have in the NZ ETS. NZ ETS reform provides an opportunity to help reduce present and future Māori socioeconomic inequities. However, it also presents a risk of exacerbating those inequities, as it might result in decisions around land use that decrease community resilience. The government will need to strike the right balance between limiting the use of marginal Māori land for planting permanent exotic forests and incentivising its use for transition to permanent indigenous forests. We refer to the statement made on page 46 of the discussion document - that increasing the cost of emissions is likely to affect the cost of living, including for whānau Māori. We acknowledge this risk and consider complementary policies outside the NZ ETS should be used to ensure these risks are identified and mitigated.
4.2 What other interests do you think are important? What has been missed?	The discussion document states that around 30 percent of Aotearoa New Zealand's 1.7 million hectares of plantation forestry is estimated to be on Māori land. The government needs to investigate and better understand how much of that plantation forestry the landowners are willing to put into permanent forestry. This information will help inform and tailor policies to either provide more benefits for indigenous forests and/or plan complementary policies to mitigate the risk factors associated with potential increases to households and costs of living.
4.3 How should these interests be balanced against one another or prioritised, or both?	We acknowledge the distinction between marginal land use opportunities and the economic incentives to plant rotation exotic and permanent exotic forest. Policy settings will need to incentivise marginal land use for transition and permanent indigenous forestry with a comparable and competitive economic return.

[2] Have your say on credit system to incentivise protection of biodiversity | Ministry for the Environment

[3] Costa Rica's Forest Conservation Pays Off (worldbank.org)

Questions	WRC response
4.4 What opportunities for Māori do you see in the NZ ETS review? If any, how could these be realised?	No further comment.
Chapter 5: Objectives and assessment criteria	
5.1 Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/why not?	Yes, we agree with the primary objective of the review to prioritise gross emission reductions in the NZ ETS, while maintaining support for removals. We advocate for objectives that focus on reducing Aotearoa's emissions.
5.2 Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low-emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real-world supply constraints allow? Why/why not?	Yes, we agree that the NZ ETS should support more gross emissions reduction as quickly as real-world supply constraints allow. However, we note that whilst the NZ ETS is designed to provide a price signal to affect behaviour, there are other mechanisms that can be used to create these incentives. We refer to the 300+ actions that are included in the National Adaptation Plan and the Emissions Reduction Plan. We also caution against the NZUs being used as an investment vehicle. The purpose of the NZ ETS should be to reduce emissions and drive removals.
5.3 Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard to-abate emissions in the longer term? Why/why not?	We agree that the NZ ETS should drive levels of emission removals that are sufficient to help meet Aotearoa New Zealand's climate goals in the short to medium term. We note however that if incentives for planting trees are removed, this will need to be balanced to ensure offsets remain an option for the hard-to-abate emissions.

Questions	WRC response
5.4 Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.	No further comment.
5.6 Are there any additional criteria or considerations that should be taken into account?	We note the potential for interest from foreign investors in New Zealand forestry and related land for the purposes of carbon-based assets. We consider there may be some risks associated with loss of control relating to these investments.
Chapter 6: Options identification and analysis	
6.1 Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapter 5?	We consider option four best aligns with the primary objective to prioritise gross emission reductions while maintaining support for removals. However, we consider this option will not be effective if the government does not address the administrative shortcomings of the current system. We refer to the proactive release of the 2022 Cabinet Paper on the proposal to update the NZ ETS limits and price control settings.[4] The Cabinet paper outlined the commission's recommendations on price control settings. The commission recommended much higher and wider auction price control settings and advocated for a change to the structure of the Cost Containment Reserve. In the Cabinet paper, the Minister of Climate Change recommended following that advice in full. The current consultation doesn't assess the proposals outlined in the 2022 Cabinet Paper, nor does the consultation document justify why these settings could not be followed. Without this analysis, there is a risk that we could be left with two inefficient markets.
6.2 Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/why not? Please provide any evidence you have.	We agree with the assessments that have been made on each option, however, as noted above, we consider the consultation document fails to assess the current administration of the NZ ETS. We recommend the consultation assesses how administrative changes to the status quo (based on the commission's advice) could affect emissions reductions. For example, we consider the trigger price for the cost containment reserve has been kept too low and does not reflect the commission's advice. The current price settings give the market confidence that an additional supply of NZUs will become

[4] nz-ets-settings-2022-cabinet-paper_redacted.pdf (environment.govt.nz)

Questions	WRC response
	available at a lower price. This does not incentivise emitters to decarbonise and a higher trigger price would drive emission reductions. We also consider that the issue of stockpiled units must be addressed. The stockpiling of units enables emitters to purchase units at a lower price and surrender those units against their emissions in the future (when the price of units is higher). This waters down the incentives to decarbonise. We acknowledge that there will be no appetite to retrospectively write off stockpiled units. However, this should be addressed to prevent it from occurring in the future. We recommend that the government introduces changes to the ETS settings to manage the number of units that emitters can stockpile and place a time period to surrender the units. We suggest the time period is linked to the emissions budget, for example, two emission budget terms.
6.3 Of the four options proposed, which one do you prefer? Why?	We consider that option four presents the greatest opportunity to incentivise reductions and removals, whilst continuing to drive down gross emissions. Option four would create two NZ ETS markets with separate prices: one for emissions reductions and another for removals. We support this approach because emitters would not be able to use forestry NZUs to 'pay' for their emissions. We also support this option because it recognises that reductions and removals should continue to be incentivised. However, for this option to operate effectively and achieve the intended purpose of the NZ ETS, we recommend the current system is reviewed to: • Modify the rules that allow for the effective application of the cost containment reserve. • Regulate the number of units in the stockpile. • Place time limits on stockpiled units. We also strongly advocate for the Government to follow the Commission's advice on the NZ ETS price settings (and trigger price). We recommend that removals such as forestry are not taken out of the current market until such time as the separate removal market is established.
6.4 Are there any additional options that you believe the review should consider? Why?	As noted above, we advocate for an approach that first addresses the NZ ETS limits and price settings in the current system.

Questions	WRC response
6.5 Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?	We acknowledge that complementary policies will be required to drive down gross emissions and incentivise removals. Many of these policies are included in the Emissions Reduction Plan and in the commission's draft advice on the second emissions budget. To achieve the overall objective of reducing emissions, policy settings to complement the ETS should protect biodiversity, prevent soil erosion, and take a multi-species and multi-use approach to ensure sustainability in the future operating environment of our changing climate. It is also imperative that these policies are integrated with adaptation policies.
6.6 Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?	We refer to our comments on the questions in chapter 4.
Chapter 7: Broader environmental outcomes and removal activities	
7.1 Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?	Yes, we support an approach that prioritises removals with environmental co-benefits such as indigenous afforestation. We support the government's recent announcement signalling a reform to the NZ ETS so it recognises all forms of carbon sinks, including recognition for wetlands, peatlands, mangroves and other non-forest land uses. We encourage research into quantifying carbon sinks for the purpose of the NZ ETS.
7.2 If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?	We consider that option 4 would provide the greatest opportunity to achieve co-benefits. However, we also advocate for further analysis on how the ETS settings will interplay with the right policy mechanism for land use control. For example, there needs to be greater understanding of the relationship between unit pricing, and existing national policy statements and environmental standards, such as the NPS for Highly Productive land.
7.3 Should a wider range of removals be included in the NZ ETS? Why/Why not?	Yes, we advocate for a wider range of removals to be included in the NZ ETS, however, we consider these may need to be weighted differently.
7.4 What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?	One option could involve weighting the co-benefits used for purchasing NZUs. Other policy mechanisms outside the NZ ETS could include tax or rates relief for sources of removals.

Redesigned NZ ETS permanent forest category

Questions	WRC response
1: How do you think the Inquiry's recommendations could be reflected in proposals to redesign the permanent forest category?	The Inquiry's recommendations could be reflected in the proposed management plans and compliance tools. These could be used as a mechanism to manage slash and setback distances from waterways.
2: Do you agree with our assessment criteria for the redesigned permanent forest category? If not, what would you change and why?	We agree with the criteria and outcomes identified. However, we recommend that criteria 3 (positive environment outcomes) includes reference to the forest's ability to support indigenous fauna. The criteria should also account for the significant risks posed by exotic forestry. We consider the government needs to demonstrate how the criteria will be assessed and how conflicts between the criteria will be managed. For example, whether there will be hierarchy. If there is to be a hierarchy of outcomes, we recommend that it is guided by the objectives to mitigate any significant environmental, economic and social consequences associated with large-scale permanent exotic afforestation. We support the outcome aimed at supporting Māori in their cultural, social, environmental, and economic aspirations for their land and the wellbeing of their communities. We caution against any unintended consequences that would make our regional communities, including Māori, worse off. We consider that the support for rural economies and communities should also reference cultural, social and environmental aspirations. Currently, this outcome only focusses on employment opportunities.
3: Do you think any of these criteria are more important than the others? If so, which criteria and why?	We note that the criteria is interlinked, however, priority should be given to criteria that aligns with the core purpose of the NZ ETS – to drive gross emission reductions at the scale and pace required to meet our climate change targets. Emphasis should also focus on outcomes that will provide for a vibrant economy, whilst protecting our natural resources. We refer to Te Oranga o te Taiao, a concept drawn from te ao Māori which supports the wellbeing of future generations without compromising the wellbeing of current generations.
4: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? (Note, options 1.2a and 1.2b are not mutually exclusive)	We favour a mixture of options 1.1. and 1.2. Our preference is for the category to focus on transition forests and indigenous forests. Option 1.1 (which proposes to only include transition forests and indigenous forests) will pose less risk to the environment if undertaken with appropriate precautions.

	However, we recognise that the effects of climate change could make some exotic species and/or mixed forests more viable than indigenous forests in certain circumstances. For example, some exotic trees might be appropriate in areas where climate change makes it difficult to regenerate or recreate indigenous forests, while providing similar ecological benefits.[5] There may also be opportunities to use permanent forests to stabilise erosion-prone land. Exotic species can also provide habitat for indigenous biodiversity e.g Macrocarpa and bats. The circumstances in which exotic forests could be included in the category would however need to be supported by further research and investigation. Any exceptions to option 1.1 should be assessed against 'the right tree in the right place' concept and the outcomes and assessment criteria included in the discussion document. We also recommend another category for indigenous forests in perpetuity. However, further consideration may need to be given to how these are defined and accounted for.
5: If you support allowing exotic species under limited circumstances, how do you think your preferred 'limited circumstance' should be defined? (for example, if you support allowing long-lived exotics to register, how do you think we should define 'long-lived'?)	The outcomes and assessment criteria should be used to define the circumstances in which exotic species are included under limited circumstances i.e. species that provide for long-term carbon sequestration; that help improve climate adaptation and resilience; and that provide positive environmental outcomes. We strongly advocate for an approach that will discourage monocultures and we suggest that the exclusions aren't solely focused on individual species. Monocultures can increase the risk of disease, fire and extreme weather events. Therefore, the 'limited circumstances' need to account for wider considerations. Selecting a mix of species, rather than planting monoculture, is important as it improves biodiversity and creates habitats for indigenous wildlife.
6: Do you think there is an opportunity to use permanent forests to stabilize erosion-prone land?	Yes, we support exceptions where exotic planting can be used for erosion control. The right ratio of different species in a specific forest should be determined based on the scientific understanding of what guarantees a higher level of resilience. We note that consideration will need to be given to the time between harvest and replanting. During this time there is increased risk of erosion and different species will take different amounts of time to grow. Therefore, the type of species planted might impact the length of time that the land is at risk of erosion.
7: Do you think the Government should consider restricting the permanent forest category to exotic species with a low wilding risk?	Yes, we consider there is a significant risk with the potential uncontrolled spread of exotic trees in areas surrounding permanent forests. We also consider that there should some accountability from forest owners/managers associated with the risk of wilding pines.

[5] Ten golden rules for reforestation to optimize carbon sequestration, biodiversity recovery and livelihood benefits (wiley.com)

8: Do you agree with the proposal for a specific carbon accounting method for transition forests? If you disagree could you please provide the reasons why? If there are other options you think we should consider please list them.	We require further detail on the accounting methods proposed to make comment on this question.
9: If you agree with the proposal for a specific carbon accounting method for transition forests, what do you think it needs to achieve?	The carbon accounting method should achieve a healthy functioning ecosystem from transition forests.
10: What do you think should occur if a forest does not transition from a predominately exotic to indigenous forest within 50 years?	If a forest does not transition within 50 years, the units for the removal activity should be surrendered, and penalties should be calculated based on the unit value. A requirement to surrender NZUs will have cost implications for the forest owners/landowners and we consider this will be the most effective driver for compliance. We advocate however for a pragmatic approach, with consideration given to circumstances where natural hazards may cause setbacks, preventing the transition to indigenous forest within 50 years. For example, wild-fires and cyclones. Where this occurs, we consider the landowner/forest owner should be required to demonstrate a proposal to restore the work that has been done to transition the forest within four years. We have recommended a four-year period because the NZ ETS defines deforestation as not replanting after four years of clearing.[6]
11: Of these options, what is your preferred approach? Why? Are there other options you prefer, that we haven't considered? Page 29	We favour both option 3.2 and 3.3 which would introduce new minimum forest management requirements. However, option 3.3 is also favourable because it proposes new forest management requirements specifically for transition forests in the permanent forest category. We recognise that if a transition forest is not managed appropriately, it could become an unmanaged plant-and-leave exotic forest. However, to fully assess these options we would need to better understand the quantum of costs associated with the additional requirements. The costs associated with the requirements should not disincentivise work to transition forests.
12: If there were to be additional management requirements for transition forests, what do you think they should be for? Why?	We consider that any additional management requirements should be timebound to ensure regular review and compliance. In addition, we consider monitoring should occur in relation to any forestry management plans. The management requirements should also account for pest control monitoring and monitoring to ensure that seed dispersal mechanisms are established.

[6] Section 179 of the Climate Change Response (Emissions Trading) Amendment Act 2008

13: Do you think transition forests should be required to meet specific timebound milestones to demonstrate they are on a pathway to successful transition?	Yes, we agree that transition forests should be required to meet specific timebound milestones to demonstrate their pathway to successful transition. If a landowner/forest owner does not meet their milestones we suggest providing a time allowance for achieving compliance before the forest is removed from the category/compliance measures are taken. The milestones should account for the type of forest, landscape and management of the forest.
14: Do you agree with this proposal to allow transition forests to be permitted to clear-fell small coupes or strips to establish indigenous species? Why? And if you agree, what other restrictions should there be?	Yes, we agree with this proposal as this would establish indigenous regrowth and start to provide seed source for the forest to transition into indigenous dominated forest. We consider that decisions to clear-fell small coupes should fall under the forestry management plan and be subject to verification by a suitably qualified assessor. We note that many exotic forests have a native understorey, and these can be decimated during harvest. If the exotic understorey could be retained post-harvest, it would provide a quicker transition into indigenous forest.
15: If forest management requirements are implemented, do you think these should be prescriptive or outcomes-focused? Why/why not?	We consider there are benefits to both a prescriptive approach and an outcomes-based approach. An outcomes-based approach would allow for site specific results and encourage innovation. However, a prescriptive approach would allow for more certainty and would provide forest owners/landowners with clear expectations and guidance. We note that it may be difficult for forest management plans to be prescriptive with the variation of forest types and locations.
16: What are your views on forest management plans?	We support forest management plans as a means of implementing the requirements. We also note that forestry management plans could be informed by expert judgment, including forestry science and mātauranga Māori. This would enable planning for forests in the category that includes exotic species under limited circumstances, and we support a model that requires mitigation of the risks associated with these species. We also recognise that the NES-PF has existing requirements for forestry earthwork management plans, harvest plan specifications and quarry erosion and sediment plan specifications. However, we note that any changes to the NES-PF relating to forest management plans can only consider RMA matters. Forest management plans for forests in the forestry category of the NZ ETS will likely require an additional layer of complexity.
17: What should forest management plans include?	As noted above, forest management plans should include details on how site specific and species specific risks will be mitigated.
18: Who do you think should be allowed to verify forest management plans?	We advocate for verification of forest management plans by a central government agency. Te Uru Rākau – the New Zealand Forest Service would seem appropriate based on their expertise.
19: How often do you think forest management plans should be audited or verified?	We consider that there should be a regular audit or verification of forestry management plans to ensure they remain relevant and address any new and emerging risks. We suggest a five yearly review cycle.

20: What do you think should happen if there are enough people to verify forest management plans?	There are a number of tertiary institutions that offer training for the forestry sector. Any shortages could be addressed by offering further educational training courses. However, we consider there are likely to be sufficiently skilled experts already within the industry that could verify forest management plans (noting that our preference is for the government to verify forestry management plan as opposed to consultants).
21: Do you think the use of existing compliance tools are appropriate?	As noted above, we consider that the units for the removal activity should be surrendered, and penalties should be calculated based on the unit value. A requirement to surrender NZUs will have cost implications for the forest owners/land owners and this is likely to be an effective driver of compliance.
22: Do you think there should be new or expanded compliance tools for permanent forests? Which ones and why?	No further comments on this question.
23: Are there other compliance options that you think we should consider?	No further comments on this question.
24: For the compliance tools you think we should have, when do you think they should be used?	No further comments on this question.

Submission by

Z Energy

to the

Ministry for the Environment

on the

Review of the New Zealand Emissions Trading Scheme

11 August 2023

Introduction

Z Energy (Z) welcomes the opportunity to submit on the Ministry of the Environment's (*the Ministry)* review of the New Zealand Emissions Trading Scheme (*ETS*) and its permanent forest category (together, *ETS Review*). Our responses to individual consultation questions can be found in Appendix A.

Z is an integrated energy company and is focused on meeting the needs of our customers now and into the future. This means, as we continue to deliver the fuel Aotearoa New Zealand needs today, we are committed to contributing to the decarbonisation of New Zealand's transport network.

As New Zealand's largest fuel retailer, Z is a major participant in the ETS, with a surrender obligation amounting to 6.8 million New Zealand Units (*NZUs*) in 2021. This is approximately 19 per cent of the entire ETS's total annual surrender obligation and means that Z has the highest single entity surrender obligation within the ETS.[1] Consequently, any changes to the ETS have a material impact on our business and what consumers pay at the pump.

Z acknowledges and supports the importance of gross emissions reductions to achieve New Zealand's emissions budgets and climate change goals, both domestic and international. The ETS is an important tool to help drive decarbonisation decisions and plays a pivotal role in helping the country achieve its emissions reductions targets. For the ETS to achieve its desired impact, it must be effective in maintaining a deep and liquid carbon market[2] with strong prices, supported by complementary policies that work in synergy to meet New Zealand's emission targets.

Z currently invests in net emissions reductions as part of our ETS compliance obligations, and through our voluntary forestry investments to reduce greenhouse gas emissions via Drylandcarbon and Forest Partners. Considering our significant compliance obligations and exposure to penalties in the event of a failure to surrender sufficient NZUs, Z has a statutory imperative to acquire large amounts of NZUs to meet its obligations. Those NZUs have been acquired as part of good corporate management and in reliance on settled ETS policy settings. In addition, Z has a range of private contractual arrangements with customers, intermediaries, and forestry investments related to the sourcing, forward sales and transfers of NZUs in statutory and contractual opt-in arrangements.

Z believes there is a real risk that the process and timing of the ETS Review (including its potentially fundamental changes to ETS structure) may create market uncertainty and undermine market confidence. If those impacts are reflected in lower NZU prices (as has been experienced in recent months), the ETS Review itself may negate any forecasted benefits from the new policy settings. We therefore urge the Government to provide urgent clarity on the path forward, in particular confirmation of the intended balance between gross and net reductions and assurance that any policy changes will be prospective, not retrospective.

Z considers it is critical that the ETS Review considers the impacts of each policy option on not only mandatory ETS participants, but also the continued presence of other key ETS market service providers. The ongoing functioning of the ETS relies on a number of intermediary service providers who aggregate and supply NZUs, provide market liquidity and price

[1] EPA, "ETS participant emissions" (October 2022), page 15. ETS-participant-emissions-report_1-July-2021-to-30-June-2022.pdf (cwp.govt.nz) ETS-participant-emissions-report_1-July-2021-to-30-June-2022.pdf (cwp.govt.nz), ETS-participant-emissions-report_1-July-2021-to-30-June-2022.pdf (cwp.govt.nz)

[2] By having intermediaries (i.e. banks) that bridge the gap between buyers and sellers, creating longer-term options for emitters through the development of forward markets and futures pricing.

discovery. A loss of confidence in the ETS and/or the functioning of the secondary market triggered by the ETS Review or the implementation of its options could result in the exit of key intermediaries who provide services relied on by mandatory participants. Such impacts have been experienced in overseas emissions trading schemes that have faced market confidence issues and are likely to be amplified in the case of the ETS given its relatively small scale, limited number of participants and reliance on relatively few service providers/intermediaries.

In this submission, Z:

- Sets out the five key principles that it considers should be used to analyse the policy options proposed in the ETS Review;

- Comments on the policy options presented in the ETS Review, concluding that Z is currently unable to support any of the options outlined in the consultation document when considered against those five key principles; and

- Strongly recommends a further round of consultation is conducted following the 2023 General Election to address seven key matters which Z considers have not been adequately addressed in the ETS Review, including the consideration of additional policy options.

We look forward to continuing to work constructively with the Government and welcome the opportunity to hold a briefing session to go through our submission in more detail.

If there is any information that would be of use to the Ministry, please do not hesitate to contact us.

Key principles for assessing policy options

We have formulated a series of principles designed to determine if issues identified in the ETS Review will be addressed through one or more of the options proposed. Z considers that these principles provide a good starting point for ETS participants, stakeholders, and the Government/officials to assess the merits of each of the four policy options presented.

Contribution to New Zealand's 2050 targets

- Will the option assist in achieving the 2050 targets and the emissions budgets?

Each option should be assessed against how much it will contribute to achieving those budgets and targets and identify when those contributions are expected to occur.

This should include an assessment of whether those reductions are gross or net and whether they are sustainable post 2050.

Effectiveness

- Will the option achieve the intended outcome of a highly functioning ETS as a key pillar of New Zealand's climate change policy framework, including a deep and liquid carbon market with strong, predictable price signals and limited price volatility?

- Additionally, does the option align with the recommendations and modelling of the independent Climate Change Commission? If not, is the option well supported by modelling and analysis of potential impacts?

The future of the carbon market is fundamental to business decision making and decarbonisation efforts, not just for Z, but across the New Zealand economy.

Viability

- Will the option promote market confidence and policy stability?

- Does it provide clarity on who can enter the market, and ensure sufficient access and supply of NZUs to meet compliance obligations?

- Does it limit pure speculation and encourage intermediary participation to facilitate liquidity, optionality, and flow of NZUs?

As noted above, Z has the highest single surrender obligation within the ETS. In light of changes made to the ETS in 2021, the ETS compliance obligation is supported by extremely serious penalties for failure to secure and surrender sufficient NZUs.[3]

Considering our significant compliance obligations and exposure to penalties in the event of a failure to surrender sufficient NZUs, Z has a statutory imperative to acquire large amounts of NZUs to meet its obligations. Those NZUs have been acquired as part of good corporate management and in reliance on settled ETS policy settings. Z also has a range of private contractual arrangements with customers, intermediaries, and forestry investments.

[2] Such penalties include the payment of penalties three times the market price of the units that were not surrendered, see section 134, Climate Change Response Act 2002.

Those arrangements include the provision services related to the sourcing of NZUs, forward sale NZU contracts, and both regulated and contractual opt-in arrangements.

It is foreseeable that the uncertainty/outcomes of some aspect of the ETS Review could affect those arrangements, with potential market confidence and certainty risks, which could result in key participants seeking to exit or change their position in the New Zealand market. As noted above, such impacts have been experienced in overseas emissions trading schemes that have faced market confidence crises (see for example the closure of Deutsche Bank's carbon trading desk in 2013). The effects of such closures are likely to be amplified in the case of the ETS given its relatively small scale, limited number of participants, and reliance on relatively few service providers/intermediaries.

As a result, Z believes it is critical that any review of the ETS consider any advance impacts of policy options on market participants (and intermediaries) who are key to the functioning of the ETS. Policy reform should not place mandatory participants in a position where non-compliance risk is high due to market dynamics. Adequate access to NZUs will be critical to ensure non-compliance risks are manageable. Later in this submission, Z discusses the potential scale of NZU market liquidity risks if NZU supplies are limited to the Government's quarterly auctions.

Durability

- Does the option have a good prospect of being an enduring and stable policy that is upheld even if the Government changes?
- Does it align with New Zealand's broader cultural, social, and environmental objectives?
- Will it contribute to New Zealand's low carbon future by ensuring value created through the ETS is reinvested back into our transition?

Fundamentally, policy must be certain and settled for the market to be stable and investors to have confidence. Z foresees continued adversity to the ETS market and risk to New Zealand achieving its low carbon transition if the ETS design is revised at the point of each change of government. We therefore need to design an option that can endure beyond political cycles. To support this, Z considers any future reviews of the ETS should be scheduled to occur outside of political election cycles with independent review of options.

Equity and fairness

- Does it support an orderly transition by allowing for appropriate grandfathering measures?
- Does it anticipate and avoid unintended consequences, such as those related to abrupt changes in contractual and statutory opt in arrangements?
- Does it minimise adverse impacts on existing market participants and investors who have undertaken reasonable actions in good faith reliance on policy directives, including the avoidance of retrospective effects on those parties?

Z's comments on policy options

Z is currently unable to support any of the options outlined in the consultation document when considered against the above five principles. The proper functioning of the ETS is of critical importance to New Zealand's climate response and ETS market participants. At present, there is simply too much uncertainty regarding the impacts of the options and not enough information available to assess these at a business, sector, economic or climate-benefit level.

However, Z is clear that it is unable to support Option 2 (create increased demand for removal activities to increase net emissions reductions), due to the unprecedented and untested proposal to open the ETS to direct competition for forestry removal NZUs from overseas buyers. Moreover, if the transfer of such units out of New Zealand was enabled, this option could perversely increase New Zealand's potential fiscal exposure to achieving even greater gross emissions reductions domestically, while having transferred the benefit of lower cost net emissions removals to overseas jurisdictions or corporates.

With respect to Options 1, 3 and 4, and any others that may be considered as part of future stages of the ETS Review, Z strongly recommends that a further round of consultation be conducted following the 2023 General Election. This should include more detailed description and analysis of policy options, including consideration of the following seven matters which Z considers are not adequately addressed in the ETS Review:

1. A clear problem definition

Currently, the problem for which the review is being designed to solve is unclear and multifaceted. If the problem is in multiple parts, then it may be preferrable to have separate policy tools adopted to address each policy driver in turn. Z considers that the reform needs to be clear as to whether the policy reforms are being primarily designed to:

- Drive gross emissions reductions alone, or a mix of gross and net emissions reductions and, if so, the ideal/intended contribution of gross and net emissions reductions; or
- Drive sustained emissions reductions to 2050 and beyond but sustaining an appropriate NZU price, with the mix of gross and net emission reductions being relevant only to the extent the emissions reductions can be sustained to achieve targets; or
- Managing undesirable exotic afforestation and accelerating desirable indigenous afforestation.

As illustrated in Box 1, Z considers there is a valid a role for forestry-related emissions reductions, including exotic rotation forestry, in the ETS as part of the low carbon future. A clear statement of the problem definition will enable that role to be clarified.

Box 1: The role of forestry and exotics in our low carbon future

Z believes there is a place for forestry in helping secure New Zealand's emissions reduction targets and low carbon future. This should be based on a 'right tree, right place' approach that aligns with New Zealand's broader cultural, social, and environmental objectives. Z supports exotics in rotational forest only and does not see a place for exotic permanent forestry for carbon farming purposes.

We see that, done right, forestry can bring benefits to a range of communities and sectors. For example, nearly all carbon farming enquiries to our investee company, Drylandcarbon,

come from farmers looking to secure a revenue stream from marginal land to support continued farming with a diversified farm income. Well managed marginal land plantings can provide a range of land stability, water quality and biodiversity benefits in addition to varied income streams.

Z considers it may be possible to ensure that net emission reductions in the future are focused on marginal land by linking ETS-forest registration to the land use classification system and national planning policy documents under the Resource Management Act 1991 (and its successors). This could limit the perceived conflict between agricultural productive land and carbon forestry, while also limiting the supply of net emission reductions into the ETS.

2. Assurance that policy changes will be prospective, not retrospective

The ETS Review document is notably silent on the extent to which the fungibility of existing NZUs and NZU investments (including both ETS registered forests and forests which are pending or in the process of being registered) would be honoured under Options 3 and 4.

Participants, such as Z, require greater clarity on the Government's intention to retrospectively apply changes in order to understand the implications on contractual arrangements entered into and on capital committed in reliance on current market settings. This is crucial to maintaining market confidence and avoiding unintended consequences / deterring commercial activity.

We strongly recommend that any ETS Review, current or future, include a clarifying statement that proposed changes will not have retrospective effect or otherwise undermine decarbonisation and compliance investments made prior to the changes. The statement should also identify the earliest potential date for reforms to take effect, which would help to support a functioning ETS market and necessary price signals while consultation occurs.

3. Direct consultation with key market participants

Z strongly recommends consultation with key market participants be prioritised. The consultation should include both mandatory participants and those critical intermediaries referred to earlier in this submission who provide essential ETS market services (many of whom are headquartered offshore). This direct engagement will help ensure that all potential consequences of proposed policy options are explored, and unintended adverse impacts on NZU liquidity are avoided.

4. Detailed analysis

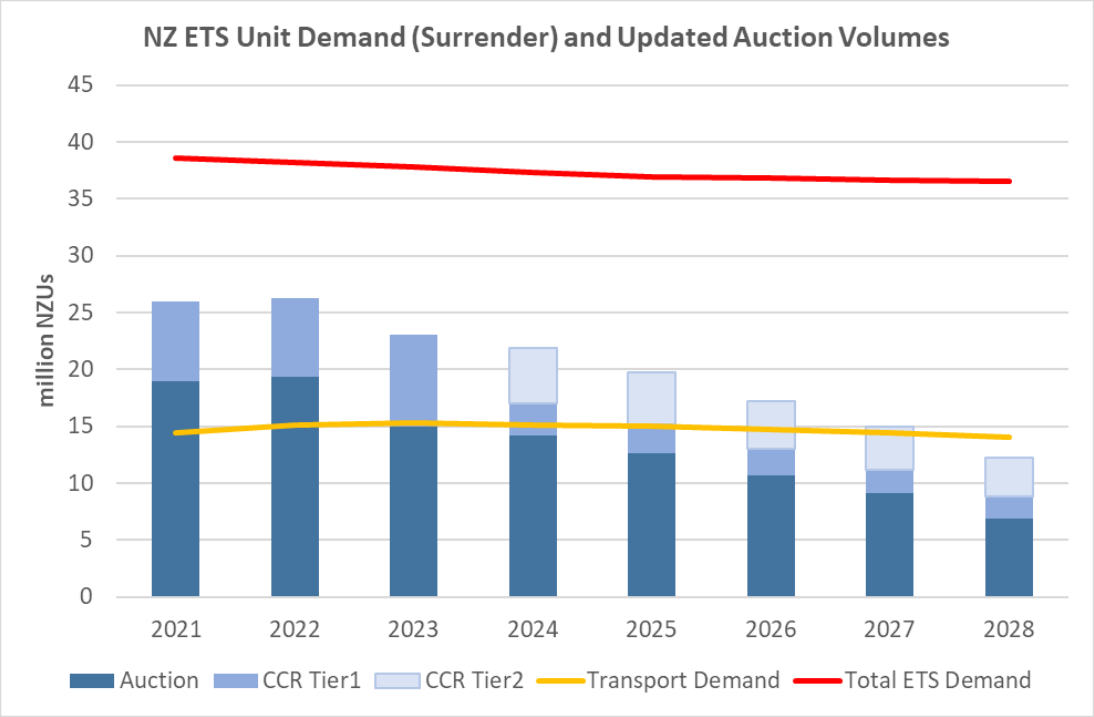
Z considers the ETS Review must include detailed modelling and impact analysis underpinning the options presented (and others that were discarded). Such modelling and analysis should be released concurrently with policy options to allow those affected sufficient time to consider the information and comment. As it stands, many indirect impacts are not considered within the ETS Review and there is no sense of the scale and consequence of those impacts that are identified. In particular, Options 3 and 4, which represent the most significant departure from the status quo, do not include any assessment of the transition effects of the changes on near-to-midterm decarbonisation action.

Z considers it critical that such analysis includes both an assessment of how existing ETS participants will be able to meet their ETS compliance obligations under each policy option, and on the consistency of the impacts of the policy on existing policy settings and decarbonisation pathways that have supported those settings. As noted in Box 2 below, the

removal of access to forestry NZUs to meet ETS obligations would create a material gap between the ETS emissions anticipated by the Climate Change Commission's demonstration pathway and the ability for those emitters to comply with the ETS. Z considers more detailed analysis of this potential gap and how it can be managed to avoid extensive ETS non-compliance or major economic and social disruption should be included in any future consultation rounds.

Box 2 – Risks Arising from the ETS Review Options

The figure below illustrates the forecast NZU demand in the NZ ETS as a whole (**red** line) and in the transport fuels sector alone (**yellow** line) based on the Climate Change Commission's demonstration pathway. It shows a considerable gap between that forecast demand and the volume of NZUs that will be available to participants through auctions, based on the most recent 2023 updates to the auction supply settings.



Data Sources:

- The 'Transport Demand' and 'Total ETS Demand' data is taken from the Climate Change Commission's most recent Demonstration Pathway from its 2023 'Draft advice to inform the strategic direction of the Government's second emissions reduction plan'
- Auction volumes are those updated on 25 July 2023

The above figure illustrates that from 2024 onwards the demand for NZUs from the transport fuels sector *alone* will exceed the total base volume of NZUs that will be available. Even if both Tiers of the Cost Containment Reserve are released to the market (requiring NZU prices of $283/NZU in 2028) the total auctioned NZU volumes will be insufficient to meet the transport fuel sector's NZU surrender obligations from 2028.

The gap between the availability of NZUs at auction and the Climate Change Commission's forecast demand for NZUs is even more stark when Total ETS demand for all mandatory participants is considered. Based on this data there is a very real risk that policy reforms that focus only on gross emissions reductions (where the only NZU supply is from auctions) will increase the risk of ETS participant non-compliance due to a major scarcity of NZUs.

Because of this gap, if forestry-NZUs are not able to utilised for surrender purposes, mandatory ETS participants like Z could be at risk of non-compliance with the ETS, despite their emission reductions being in keeping with the emission reduction trajectories outlined in the Climate Change Commission's demonstration pathway.

Z acknowledges that there is a significant pool of banked units (160 million at 30 June 2023), however Z has no control or clear insight as to whether sufficient volumes of those units can in reality be released to the market. Indeed, of that pool 116 million (73%) are held by participants and direct recipients of NZUs, who typically hold NZUs to meet future surrender and contractual energy cost pass-through obligations. Consequently, there is a material risk that those NZUs will not be released to the market.[4] Of the remaining 44 million, a significant proportion are likely to be encumbered, i.e. held by intermediaries and market makers on behalf of participants, and are also unlikely to be released to the market. Z therefore assesses the available market pool of banked units to be substantively less than 1-year's total NZU demand.

In previous submissions Z has highlighted the potentially adverse economic and political risks should the transport fuels sector be faced with the dilemma of having to sell fuel as a 'lifeline utility' to keep the economy functioning, while being unable to secure enough NZUs to meet NZ ETS surrender obligations.

In addition, based on the information in the ETS Review documents, we foresee a real risk that the process and timing of the ETS Review (including its potentially fundamental changes to ETS structure) may create market uncertainty and undermine market confidence. If those impacts are reflected in lower NZU prices (as has been experienced in recent months), the ETS Review itself may negate any forecasted benefits from the new policy settings. We therefore urge the Government to provide urgent clarity on the path forward, in particular confirmation of the intended balance between gross and net reductions and assurance that policy changes will be prospective, not retrospective. Z also suggests that the next round of consultation includes full analysis not only of the impacts of the policy settings themselves but of how the current ETS transitions to the new structural arrangements (including timing and impacts).

5. Consideration of other options

If a broad ETS review is considered necessary by the Government in light of the problem definition, Z suggests a wider array of policy options are identified and analysed as part of the next stage of review. Z strongly believes there are other policy options that should be considered as we outline in the section below.

6. Consideration of appropriate timing

Emissions Budget 1 and 2 are crucial time periods for decarbonisation investments by the government and private sector, particularly in the electrification of the transport and industrial sectors. Z acknowledges that major ETS policy changes in those budget periods could upset the stability and predictability of policy and price signals that are necessary for businesses and individuals to make material decarbonisation investments. Accordingly, any detailed review should consider and identify the appropriate timing for making major changes associated with each policy option.

7. Assessment of policies against appropriate principles or factors

It is important that the ETS Review identify the factors that have been assessed when considering various policy options. Z considers, as a minimum, these assessment principles

[4] Data source: https://epa.govt.nz/industry-areas/emissions-trading-scheme/market-information/privately-held-units/

should include those set out above, which we have assessed the four policy options included in the consultation against.

Additional policy options for consideration

As noted above, following clarification of the problem definition, Z believes there may be other ways to reduce gross emissions or contribute to the outcomes sought. This could include options such as:

- **Measures to increase net emissions reductions without additional planting, including via extensions to the age of averaging for exotic forests**.

Z supports the concept of an extended (e.g. 50-year) rotation period under the ETS averaging accounting rules for exotic forestry, as it sits at the heart of the concept of 'right tree, right place'.

The current rotation length under averaging accounting ETS settings has resulted in a range of detrimental social and environmental outcomes. The rotation length has led to forest owners maximising carbon outcomes over a short 16-year sequestration period. This has resulted in the targeting and planting of more productive farmland that supports rapid initial tree growth and the concentration of that forestry in regions that generate that growth.

Extending the averaging accounting rotation (e.g. to 50-years) for exotic forestry would halve the volume of land needed to be planted for the same carbon outcome. Z believes this would substantially address concerns around the expanding scale of carbon forestry.

- **Developing a set of incentives to support farmers and Māori landowners to realise the benefits from timber.**

Z supports the concept of incentivising the responsible harvesting of timber, which could materially reduce the risk of 'the lock up and leave' approach to exotic forestry – mitigating the need to pursue large scale transition forestry when the outcomes are largely unknown. This concept is also raised in the submission by Lewis Tucker & Co.

- **Imposing clear obligations for comprehensive pest management plans to be carried out in all exotic and indigenous forests, particularly for the control of deer, pigs, and goats.**

Z believes this concept will allow for the positive environmental impacts of forestry to be maximised across an area much larger than the forest footprint. As the submission by Lewis Tucker & Co observes, active pest management in all forests could bring pest populations across much of the country under control, while also protecting the sequestration capabilities of our indigenous forests. Fire management plans should also be mandatory across all forests to address the significant health and safety risk that arises should an event occur.

- **Alternative methods of managing exotic forestry.**

Creating limitations on planting locations, areas, methods, and species via planning policy under the environmental and planning laws (the Resource Management Act 1991 and/or its successor, the Natural and Built Environment Bill). Options for achieving this are addressed in Box 1 above.

- **Expansion of ETS removal activities to incentivise non-forestry net emissions reductions and/or allocations to support gross emissions reductions.**

Currently, the ETS's principal recognised removal activity is forestry sequestration. Z recommends the ETS Review consider including other non-forestry removal activities to

encourage more diverse net emissions reductions. These could, for example, encourage carbon capture storage and/or encourage gross emissions reductions in hard to abate sectors.

- **Reconsideration of carbon tax policy in specific sectors.**

Given the potentially significant scale of the ETS Review's other policy options, Z considers it would be appropriate to also consider the role of other pricing mechanisms such as a carbon tax. Such a carbon tax could be an alternative to the ETS for certain lifeline sectors, such as liquid fossil fuels, where product demand is expected to continue while alternative fuel sources are being developed. Such an alternative price-based mechanism would have the added benefit of avoiding the compliance risks for participants illustrated in Box 2 above.

As with the ETS, an alternative price-based mechanism or carbon tax/levy would provide a price signal to consumers, while also enabling the Government to gather and use the tax revenue for emissions reduction policies. Those tax revenues could include purchasing of forestry units or direct funding abatement projects which are in line with its broader climate goals (e.g. permanent native afforestation).

Annex 1: Z Energy's responses to specific consultation questions

Review of the New Zealand Emissions Trading Scheme – Ministry for the Environment	
Chapter 2 - Consultation questions	
2.1	**Do you agree with the assessment of reductions and removals that the NZ ETS is expected to drive in the short, medium and long term?**
	It is vital that the outcomes of the ETS Review strike the right balance between net and gross emission reductions within a policy framework that is both fair and equitable, as well as effective in enabling New Zealand to meet its 2050 targets. Based on the information available, Z is unable at this stage to provide its support for any of the options as against the principles outlined in our submission above. The proper functioning of the ETS is of critical importance to New Zealand's climate response and ETS market participants. There is simply too much uncertainty regarding the impacts and not enough information available to assess these at a company, sector, economy-wide or climate benefit level. Z's broader concern is the focus on the ETS drivers in isolation from other existing and potential policy measures.
2.2	**Do you have any evidence you can share about gross emitter behaviour (sector specific, if possible) in response to NZU prices?**
	Z's observation is that without long-term, stable policy and direction, market reaction to continual policy change can create profit taking motives for gross emitters and other market participants, with disregard for what the ETS is designed to do – drive low-carbon investment and encourage decarbonisation. This activity/response can create further volatility and add to the lack of confidence in the market for other participants.
2.3	**Do you have any evidence you can share about land owner and forest investment behaviour in response to NZU prices?**
	Z believes that in recent times the perceived change in policy direction has created material uncertainty causing foresters to pull back from investment, which is counter to driving low-carbon investment and decarbonisation activities.
2.4	**Do you agree with the summary of the impacts of exotic afforestation? Why/Why not?**
	As set out in our submission above, Z believes there is a place for exotic forestry in helping secure New Zealand's emissions reduction targets and low carbon future. This should be on a 'right tree, right place' basis that aligns with New Zealand's broader cultural, social, and environmental objectives. Z supports exotics in rotational forest only and does not see a place for exotic permanent forestry for carbon farming purposes. We see that, done right, forestry can bring benefits to a range of communities and sectors. For example, most of all carbon farming enquiries to our investee company, Drylandcarbon, come from farmers looking to secure a revenue stream from marginal land to support continued farming with a diversified farm income. Well managed

	marginal land plantings can provide a range of land stability, water quality and biodiversity benefits in addition to varied income streams. Z considers it may be possible to ensure that net emission reductions in the future are focused on marginal land by linking exotic rotational ETS-forest registration to the land use classification system and national planning policy documents under the Resource Management Act 1991 (and its successors). This could limit the perceived conflict between agricultural productive land and carbon forestry, while also limiting the supply of net emission reductions into the ETS.
Chapter 3 - Consultation questions	
3.1	**Do you agree with the case for driving gross emissions reductions through the NZ ETS? Why/why not? In your answer, please provide information on the costs of emissions reductions.**
	Z acknowledges and supports the importance of gross emissions reductions to achieve New Zealand's emissions budgets and climate change goals, both domestic and international. While achieving those goals requires the ETS to drive material reductions in gross emissions, the broader policy and regulatory environment as set by the Government must also foster investment in decarbonisation and align with the efforts to transition to a low carbon economy. This includes setting evidence-based policies that communicate clear signals to the market and help eliminate barriers to decarbonisation.
3.2	**Do you agree with our assessment of the cost impacts of a higher emissions price? Why/Why not?**
	Z encourages the Government to review the aggregate cost impacts and associated analysis on a sector-by-sector basis. For example, high carbon prices alone do not drive emissions reductions in private transport, due to ETS costs making up a comparatively small component of fuel prices and given other barriers limiting consumer ability to change to alternative forms of transport. Consequently, measures to alleviate costs that are not effective in driving emissions reductions need to be reconsidered.
3.3	**How important do you think it is that we maintain incentives for removals? Why?**
	Until more detailed modelling and analysis is undertaken to assess the desired balance between removals and gross emissions reductions, the uncertainty surrounding incentives for removals must be addressed, especially in relation to the issue of potential retrospective impacts (as raised in our submission above). Z believes this modelling and analysis will need to address the appropriate mix and timing of gross and net emissions reductions necessary to meet the 2050 targets and emissions budgets. It is likely that some degree of net emissions reductions will be necessary to meet the 2050 target. Policy development should only be undertaken once modelling has identified what the necessary contribution of net emissions reductions is, and which emissions budget will require those net emissions reductions. Z considers, once that has been determined, ETS and wider climate policy can target the right sort of emissions (net or gross) at the right time to support achievement of the 2050 target.

Chapter 4 - Consultation questions	
4.1	**Do you agree with the description of the different interests Māori have in the NZ ETS review? Why /Why not?**
	Z does not feel best placed to answer this question.
4.2	**What other interests do you think are important? What has been missed?**
	As above.
4.3	**How should these interests be balanced against one another or prioritised, or both?**
	As above.
4.4	**What opportunities for Maori do you see in the NZ ETS review? If any, how could these be realised?**
	As above.
Chapter 5 - Consultation questions	
5.1	**Do you agree with the Government's primary objective for the NZ ETS review to consider whether to prioritise gross emissions reductions in the NZ ETS, while maintaining support for removals? Why/Why not?**
	Z strongly recommends that a further round of consultation be conducted in relation to the ETS Review following the 2023 General Election. Z believes that currently, the problem for which the ETS Review is being designed to solve is unclear and multifaceted. If the problem is in multiple parts, then it may be preferrable to have separate policy tools adopted to address each policy driver in turn. Z considers that the reform needs to be clear as to whether the policy reforms are being primarily designed to: • Drive gross emissions reductions alone, or a mix of gross and net emissions reductions and if so, the ideal/intended weighting between gross and net; or • Drive sustained emissions reductions to 2050 and beyond but sustaining an appropriate NZU price, with the mix of gross and net emission reductions being relevant only to the extent the emissions reductions can be sustained to achieve targets; or • Managing undesirable afforestation and accelerating desirable afforestation. As we note in our submission, depending on the problem definition, Z believes there may be other ways to reduce gross emissions or contribute to the outcomes sought. This includes options such as measures to increase net emissions reductions without additional planting, including via extensions to the age of averaging for exotic forests; Developing a set of incentives to support farmers and Māori landowners to realise the benefits from timber; Making clear comprehensive pest management plans to be carried out in all exotic and indigenous forests, particularly for the control of deer, pigs, and goats; Alternative methods of managing exotic forestry; Expansion of removal activities to incentivise non-forestry net emissions reductions and/or allocations to support gross emissions reductions; and Reconsideration of carbon tax policy in specific sectors.

5.2	**Do you agree that the NZ ETS should support more gross emissions reductions by incentivising the uptake of low emissions technology, energy efficiency measures, and other abatement opportunities as quickly as real world supply constraints allow? Why/Why not?**
	Z believes it is vital that the outcomes of the ETS Review strike the right balance between net and gross emission reductions within a policy framework that is both fair and equitable, as well as effective in enabling New Zealand to meet its 2050 target. As already outlined, Z considers that more detailed modelling and analysis needs to be undertaken, including to address the appropriate mix and timing of gross and net emissions reductions necessary to meet the 2050 targets and emissions budgets. It is likely that some degree of net emissions reductions will be necessary to meet the 2050 target. Policy development should only be undertaken once modelling has identified what the necessary contribution of net emissions reductions is, and which emissions budget will require those net emissions reductions. Z considers, once that has been determined, ETS and wider climate policy can target the right sort of emissions (net or gross) at the right time to support achievement of the 2050 target. Z is currently unable to support any of the options outlined in the consultation document when considered against the principles outlined in our submission above. The proper functioning of the ETS is of critical importance to New Zealand's climate response and ETS market participants. At present, there is simply too much uncertainty regarding the impacts of the options and not enough information available to assess these at a business, sector, economic or climate-benefit level.
5.3	**Do you agree that the NZ ETS should drive levels of emissions removals that are sufficient to help meet Aotearoa New Zealand's climate change goals in the short to medium term and provide a sink for hard to abate emissions in the longer term? Why/why not?**
	Z agrees with this statement in principle but suggests that this is a policy and economic choice for which options on the pace, economic impacts and practicality have not yet been evaluated and reported to stakeholders.
5.4	**Do you agree with the primary assessment criteria and key considerations used to assess options in this consultation? Are there any you consider more important and why? Please provide any evidence you have.**
	It is important that the ETS Review identify the factors that have been assessed when considering various policy options. Z has formulated a series of principles designed to determine if issues identified in the ETS Review will be addressed through one or more of the options proposed. Z considers that these principles provide a good starting point for ETS participants, stakeholders, and the Government/officials to assess the merits of each of the four options presented. We consider, as a minimum, these assessment principles should include: • Contribution to New Zealand's 2050 targets • Effectiveness • Viability • Durability • Equity and fairness Each of these principles is expanded on in our submission above.

5.5	**Are there any additional criteria or considerations that should be taken into account?**
	As above in our response to question 5.4.
Chapter 6 - Consultation questions	
6.1	**Which option do you believe aligns the best with the primary objectives to prioritise gross emissions reductions while maintaining support for removals outlined in chapters?**
	Z is currently unable to support any of the options outlined in the consultation document when considered against the principles we have outlined in our submission. The proper functioning of the ETS is of critical importance to Aotearoa's climate response and ETS market participants. At present, there is simply too much uncertainty regarding the impacts of the options and not enough information available to assess these at a business, sector, economic or climate-benefit level. However, Z is clear that it is unable to support Option 2 (create increased demand for removal activities to increase net emissions reductions), due to the unprecedented and untested proposal to open the ETS to direct competition for forestry removal NZUs from overseas buyers. Moreover, if the transfer of such units out of New Zealand was enabled, this option could perversely increase New Zealand's potential fiscal exposure to achieving even greater gross emissions reductions domestically, while having transferred the benefit of lower cost net emissions removals to overseas jurisdictions or corporates. We have expanded on our reasons for this position in our submission above.
6.2	**Do you agree with how the options have been assessed with respect to the key considerations outlined in chapter 5? Why/Why not? Please provide any evidence you have.**
	As per our response to question 5.4.
6.3	**Of the four options proposed, which one do you prefer? Why?**
	As per our response to question 6.1.
6.4	**Are there any additional options that you believe the review should consider? Why?**
	As per our response to question 5.1, depending on the problem definition, Z believes there are other ways to reduce gross emissions or contribute to the outcomes sought.
6.5	**Based on your preferred option(s), what other policies do you believe are required to manage any impacts of the proposal?**
	If a broad ETS review is considered necessary by the Government in light of the problem definition, Z suggests a wider array of policy options are identified and analysed as part of the next stage of review. Z strongly believes there are other policy options that should be considered as we outline in our submission. We strongly recommend that a further round of consultation be conducted following the 2023 General Election. This should include more detailed policy options, together with: • A clear problem definition

	• Assurance that policy changes will be prospective, not retrospective • Direct consultation with key market participants • Detailed analysis • Consideration of other options • Consideration of appropriate timing • Assessment of policies against appropriate principles or factors Each of these points are expanded on in our submission above.
6.6	**Do you agree with the assessment of how the different options might impact Māori? Have any impacts have been missed, and which are most important?**
	Z does not feel best placed to comment on this question.
Chapter 7 - Consultation questions	
7.1	**Should the incentives in the NZ ETS be changed to prioritise removals with environmental co-benefits such as indigenous afforestation? Why/Why not?**
	Z supports complementary or additional policy incentives to prioritise removals with environmental co-benefits such as indigenous afforestation. Indigenous forests will play an important role in providing a long-term carbon sink to offset residual emissions through to 2050 and beyond given their ability to sequester carbon for hundreds of years. Without incentives, we anticipate indigenous afforestation will continue to proceed slowly and on a small scale.
7.2	**If the NZ ETS is used to support wider co-benefits, which of the options outlined in chapter 6 do you think would provide the greatest opportunity to achieve this?**
	As Z has outlined above, Z is currently unable to support any of the options outlined in the consultation document, but supports development of complementary or additional policy incentives to prioritise removals with environmental co-benefits.
7.3	**Should a wider range of removals be included in the NZ ETS? Why/Why not?**
	Z foresees meaningful co-benefits through further incentives for sequestration, but we do not currently have enough information to engage on this particular question.
7.4	**What other mechanisms do you consider could be effective in rewarding co-benefits or recognising other sources of removals? Why?**
	Z foresees that without additional incentives, co-benefits associated with indigenous biodiversity restoration are unlikely to proceed at the pace and scale needed to support the level of decarbonisation set out by the Climate Change Commission in its demonstration pathway. We anticipate there will be a range of ways to effectively reward co-benefits or recognise other sources of removals, but we do not currently have enough information to engage on this particular question.

Review of the permanent forestry category – Ministry for Primary Industries	
Design choice 1: Which forests should be allowed in the permanent forest category?	
	Z believes there is a place for forestry in helping secure New Zealand's emissions reduction targets and low carbon future. This should be based on a 'right tree, right place' approach that aligns with New Zealand's broader cultural, social, and environmental objectives. Z supports exotics in rotational forest only and does not see a place for exotic permanent forestry for carbon farming purposes. We see that, done right, forestry can bring benefits to a range of communities and sectors. For example, nearly all carbon farming enquiries to our investee company, Drylandcarbon, come from farmers looking to secure a revenue stream from marginal land to support continued farming with a diversified farm income. Well managed marginal land plantings can provide a range of land stability, water quality and biodiversity benefits in addition to varied income streams. Z considers it may be possible to ensure that net emission reductions in the future are focused on marginal land by linking ETS-forest registration to the land use classification system and national planning policy documents under the Resource Management Act 1991 (and its successors). This could limit the perceived conflict between agricultural productive land and carbon forestry, while also limiting the supply of net emission reductions into the ETS.

ENDS