

Coversheet: Reducing greenhouse gas emissions from the agriculture sector

Advising agencies	<i>Environment, Primary Industries</i>
Decision sought	<i>Agreement to develop a scheme for farm level pricing of biological greenhouse gas emissions from the agriculture sector from 2025, with interim steps to be set in legislation earlier, including bringing these emissions into the New Zealand Emissions Trading Scheme at processor level in 2021.</i>
Proposing Ministers	<i>Climate Change</i>

Summary: Problem and Proposed Approach

<p>Problem Definition</p> <p>What problem or opportunity does this proposal seek to address? Why is Government intervention required?</p>
<p>Urgent transformational economy-wide action is needed in New Zealand as part of the global response to the challenge of constraining climate change. Further reductions in agricultural emissions of methane and nitrous oxide are required to meet New Zealand’s domestic and international greenhouse gas emissions targets for 2030 and 2050.</p> <p>The burden of making the necessary low-emissions transition also needs to be distributed efficiently and equitably across the economy. Other greenhouse gas emissions in the economy (from energy, waste and industrial processes) are already priced through the New Zealand Emissions Trading Scheme (NZ ETS) and only agricultural emissions of the potent greenhouse gases methane and nitrous oxide are not priced.</p> <p>Government intervention is necessary to deliver the emissions reductions required because the status quo does not provide sufficient incentive for the uptake of emissions-reducing practices and technologies across the agriculture sector.</p> <p>An ideal policy mix would build the capacity and capability to find new and better ways to further reduce the biological emissions from agriculture over time, consistent with maintaining a profitable agricultural sector within a productive, sustainable and inclusive economy.</p>
<p>Proposed Approach</p> <p>How will Government intervention work to bring about the desired change? How is this the best option?</p>
<p>The proposal is a staged approach to introducing a price on biological greenhouse gas emissions from the agriculture sector, with the intention of pricing livestock emissions at the farm level and fertiliser emissions at the processor level from 2025 onwards.</p> <p>Final decisions would be subject to a report in 2022 to confirm the feasibility and clarify the core design features for the farm-level pricing scheme.</p>

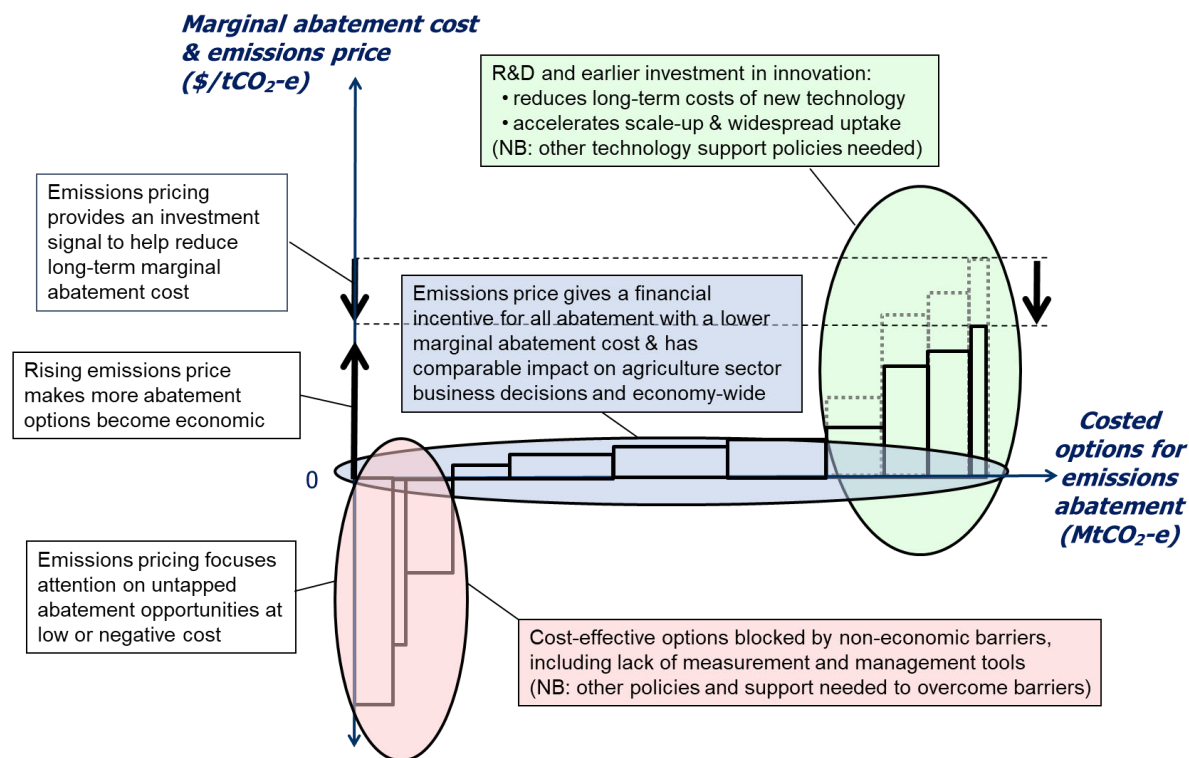
As an interim step, it is proposed to price livestock and fertiliser emissions at processor level in the NZ ETS from 2021 (as recommended by the Interim Climate Change Committee) with 95 per cent free allocation locked in until 2025 (in keeping with the New Zealand Labour Party-New Zealand First Coalition Agreement). The agriculture sector will therefore only face five per cent of the cost of its biological emissions for at least the next five years.

Pricing agricultural emissions creates a “polluter pays” price signal that will provide:

- a direct financial incentive to reduce or offset agricultural greenhouse gas emissions
- increased focus for the government and the agriculture sector to work together to identify and take measures to overcome the barriers to wider uptake of cost-effective emissions reduction opportunities
- additional encouragement for increased investment in innovation and technology development to create greater mitigation opportunities in the future and lower the cost of their eventual widespread uptake.

Starting with a relatively blunt and low level pricing signal covering only 5 per cent of agriculture emissions will have only a small effect in making more abatement options economically viable. But it will also provide greater clarity and raise expectations about future emissions pricing intentions. The figure¹ below illustrates the ways an emissions price signal works with other policies at different points along the marginal abatement cost curve to reduce the overall emissions price and costs of transition.

How pricing emissions supports the agriculture sector to transition to lower emissions at manageable economic cost on a comparable basis to the rest of the economy



¹ Adapted from Hood, C. (2011), Summing up the Parts: Combining Policy Instruments for Least-Cost Climate Mitigation Strategies, OECD/IEA, Paris.

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Implementing a farm level emissions pricing scheme will be challenging. A broader policy package is needed to ensure that a long term farm level price incentive is fully effective in reducing agriculture sector emissions and meeting New Zealand's emissions targets in a practical, efficient and cost-effective way. Better on-farm emissions estimation, monitoring and verification tools are needed to deal with the highly diffuse nature of agricultural emissions.

It is therefore a critical part of this proposal that the Ministry for the Environment (MfE) and Ministry for Primary Industries (MPI) should develop and implement a joint Action Plan with the agriculture sector and iwi/Māori to build the systems and capability required to implement the farm-level scheme from 2025.

As an alternative to interim emissions pricing at processor level through the NZ ETS, the Primary Sector Leaders Group has proposed a formal sector-government agreement based on *He Waka Eke Noa: Primary Sector Climate Change Commitment*². Under this approach there would be no introduction of agricultural emissions pricing until a farm-level scheme was ready to be implemented in 2025. Adopting this approach could achieve greater 'buy-in' from the sector to support farm-level pricing in 2025, but would give less regulatory certainty, create a weaker forward investment signal, and delay addressing the intersectoral efficiency and equity concerns. However, if the formal sector government agreement could be strengthened to deal with these draw-backs, it could be a viable alternative interim option.

Section B: Summary Impacts: Benefits and costs

Who are the main expected beneficiaries and what is the nature of the expected benefit?

The economic benefits of incentivising greater reductions in agricultural emissions are likely to be widespread across the economy and to gradually build up over the longer term.

There will be specific benefits for agricultural businesses and land-owners in situations where the emissions price drives greater productivity and/or more profitable land use and farming systems³. Reducing agricultural greenhouse emissions will also contribute to the ongoing social licence⁴ and sustainability of the agriculture sector, including co-benefits where reducing emissions will also help deal with other environmental pressures, such as better management of freshwater resources. These benefits are difficult to quantify.

To the extent the additional emissions reductions will offset the need to purchase international units in order to meet targets, notably the 2030 Nationally Determined Contribution (NDC) under the Paris Agreement, there will be a direct benefit to the New Zealand economy in avoiding the cost of purchasing those international units. These

² Available on various Primary Sector Leader Group member organisation websites, eg.

<http://www.hortnz.co.nz/assets/Primary-Sector-Climate-Change-Commitment-July-2019-.pdf>

<https://beeflambnz.com/sites/default/files/Primary%20Sector%20Climate%20Change%20Commitment.pdf>

³ Examples include shifting to more arable and horticultural land uses, improved pasture management, and reductions in fertiliser use and high protein feed supplements.

⁴ Social licence refers to general public trust in a sector and the adequacy of its current regulatory settings, resulting in broad acceptance of its operating practices by the community at large including its consumer base. Key factors in maintaining the social licence for the New Zealand agriculture sector include satisfying public and market expectations for humane animal welfare practices, improving water quality, and better managing other wider environmental effects.

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benefits can be monetised by calculating the value of emissions reductions at projected emissions prices.

However, any such calculation depends critically on a number of assumptions and even the availability and expected price of international units is uncertain as the necessary international market arrangements are still under development. For example, if we assume a 2030 global emissions price of \$35 per tonne of carbon dioxide equivalent (tCO₂-e), the present value (PV) of the estimated additional emissions reductions and carbon sequestration over the period 2021-2025 would be in the order of \$25 million (ie. the estimated outcome from the initial policy of a processor level NZ ETS for livestock and fertiliser emissions with 95 per cent free allocation at a domestic emissions price of \$25/tCO₂-e).

Including this estimate in the benefit cost analysis for bringing agriculture emissions into the ETS at processor level over the period 2021-2025 resulted in a benefit cost ratio (BCR) of 1.1 – only marginally positive. The BCR is low because it is only an interim measure with initial set up and transaction costs. It is being implemented with the intention of getting the sector ready for the long-term policy with much greater potential to change farm practice leading to much larger emission reduction benefits over time.

Regardless of the extent to which New Zealand meets its targets by domestic action, there are benefits from ensuring mitigation activity in the agriculture sector is incentivised comparably with action in other sectors. This will increase the allocative efficiency of the New Zealand economy by avoiding resources being misdirected to higher cost abatement in other sectors. It will also improve dynamic efficiency by helping ensure investment in innovation and technology development so that agriculture does not face costs of future abatement that are higher than necessary. These allocative and dynamic efficiency benefits have not been estimated as they are difficult to quantify in monetary terms and the different estimation techniques available often produce different results.

The social licence benefit to the agriculture sector, both domestically and in the increasingly sophisticated consumer-driven export markets, arises from being seen as playing a responsible role in the global effort to restrict temperature rise and keep the damage losses and adaptation costs of climate change to within tenable limits. This benefit is also difficult to quantify and monetise. However the strategic marketing efforts of New Zealand agricultural processors to establish environmental sustainability credentials gives an indication that building and maintaining this aspect of social licence has a tangible benefit.

Internationally, it is recognised that the agriculture sector is an important export sector and a key contributor to the New Zealand economy, and that agriculture emissions are an unusually large proportion of our emissions profile. However, as other nations make strong reductions in their carbon emissions, agricultural emissions will increase as a proportion of total global emissions, and become an increasing focus for New Zealand's international leadership credentials. Taking action on agricultural emissions will strengthen New Zealand's hand in the globally negotiated system under the Paris Agreement, to help bring other nations along with us to deliver the increasingly ambitious action on climate change that is required, and distribute the burden efficiently and equitably between nations.

Where do the costs fall?

The immediate costs of applying and responding to a price on agricultural emissions fall on those who face the price and must factor it into their business and investment decisions. There are also costs for government to develop and administer the scheme.

Interim processor level NZ ETS scheme 2021-2025

The proposed interim processor-level emissions price from 2021 is expected to be passed on to farmers and growers through reduced payouts and increased fertiliser costs. At an assumed NZ ETS emissions price of \$25t/CO₂-e with 95 per cent free allocation, these impacts are estimated at 1 cent per kilogram (c/kg) of milk solids; 1c/kg of beef; 3c/kg of sheep meat; 4c/kg of venison; and \$2.92 per tonne of urea.

Table: Estimated cost impacts at an emissions price of \$25/tCO₂e with 95% free allocation⁵ expressed on a unit output basis & compared to product price (averaged over last 5 years)⁶

Product (unit)	Emissions cost per unit	Product price per unit
Milk solids (kg)	\$0.01	\$5.73
Beef (kg)	\$0.01	\$5.31 (prime) \$3.85 (manufacturing)
Sheep meat (kg)	\$0.03	\$6.11 (lamb) \$3.28 (mutton)
Venison (kg)	\$0.04	\$8.20
Urea (tonne)	\$2.92	\$555 (ex works)

Based on scenario analysis undertaken by Manaaki Whenua – Landcare Research (MWLR)⁷ using their New Zealand Forestry and Agricultural Regional Model (NZFARM), total net revenue⁸ across the agriculture and forestry sector would drop by 0.4 per cent compared to a business as usual scenario, with an estimated net present value (NPV) of \$150 million over 2021-2025. This is officials’ best estimate of the total impact of the costs passed through from processors plus the relatively small amount of abatement activities and land use change that would likely be triggered by the price signal under this scenario.

Most of this cost (approximately \$146 million NPV) is a transfer to the government in the form of NZ ETS revenues⁹. (The Labour Party-New Zealand First Coalition Agreement provides that this revenue would be recycled back to the sector. This is a potential source of funding for the Action Plan to boost the sector’s ability to respond to farm level pricing from 2025.)

Additional administration costs for the New Zealand Emissions Trading Register (operated by the Environmental Protection Authority) include one-off set-up costs of approximately \$0.94 million with ongoing per-annum costs of approximately \$0.67 million.

⁵ Interim Climate Change Committee calculations of costs per unit

⁶ Data from MPI, Beef + Lamb NZ, Agri HQ and Ravensdown

⁷ See Appendix B for further description of the MWLR report *Modelling of agricultural climate change policy scenarios*, August 2019

⁸ Net revenue is an estimate of aggregate farm profit (annual earnings before interest and taxes - EBIT). It is calculated as the net revenue earned from projected output sales less fixed and variable farm expenses, including the capital cost of additional investment needed to implement new land management practices.

⁹ Purely financial transfers are generally considered to be resource neutral to the economy, although most economists and Treasury departments concur that transfers through government accounts generally bring a deadweight loss due to inefficiencies inherent in government revenue and spending systems.

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Farm level emissions pricing from 2025

Under the proposed staged approach, the only cost and benefits that will be definitively incurred are for the interim 2021-2025 period as outlined above. The costs of implementing a farm-level emissions price from 2025 will depend on the final design of the scheme, which is contingent on decisions that will be taken after the proposed feasibility and design report is delivered in 2022.

However, assuming the intended move to farm level pricing is confirmed and implemented, there will clearly be increased costs of adjustment. These costs and impacts will only be able to be assessed in detail during the preparation of the 2022 report when the detailed analysis of different design options will be carried out. How this impacts on agricultural subsectors and individual farming businesses depends crucially on decisions about free allocation and the resulting marginal price on emissions.¹⁰

There will be costs to farmers and growers faced with the choice of either taking action to reduce their emissions or paying for their emissions at the prevailing emissions price, plus compliance costs. Compliance costs are likely to be highly dependent on the final design of the scheme.

The annual administration costs of a farm-level pricing scheme from 2025 will vary significantly depending on the number of participants; the level of complexity of the allocation methodology; and the level of compliance. Officials estimate costs of a farm-level pricing scheme range anywhere from \$20 million to \$120 million per annum, depending on the design of the scheme. There would also be additional set-up costs in the order of \$7 million to \$15 million.

The joint Action Plan with the agriculture sector and iwi/Māori to build the systems and capability required to implement the farm-level scheme from 2025 is dependent on objectives, priorities and contributions to be negotiated between the parties and has not been costed.

What are the likely risks and unintended impacts, how significant are they and how will they be minimised or mitigated?

How exactly individuals and firms respond to price signals and the cumulative effects cannot be fully known in advance. Achieving a just transition to a low emissions climate resilient economy is a long term exercise in adaptive management to maximise opportunities and benefits (including co-benefits) and minimise any potential adverse economic impacts or other risks. Taken together, the government's economic strategy in pursuit of a productive, inclusive, sustainable economy, its emphasis on increasing the well-being of New Zealanders as an overarching goal, and its policies and programmes to address any significant inequity of impacts under the banner of a just transition, all provide a comprehensive policy framework for minimising and mitigating any undesirable outcomes.

More specifically, there are a range of established mitigation measures by which the government can adjust the immediate and wider economic impact of any particular price path. Initial free allocation of 95 per cent of agriculture emissions and a commitment to

¹⁰ The MWLR modelling includes a scenario where farmers face a price on 100% of their actual emissions and the 95% free allocation based on historical emissions is redistributed separately of the emissions pricing scheme, modelled for simplicity as a lump sum payment to the agriculture sector as a whole. This scenario results in significant reductions in pastoral farming and shifts into horticulture, arable and forestry as these become relatively more profitable.

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recycle revenues into a range of measures to enable and assist farmers and growers to respond to the price signal are two examples that have been built into the proposal from the outset.

The two main risks relate to:

- the cumulative impact of this proposal together with other current regulatory proposals affecting the agriculture sector
- wider consequences of land use change – for example sheep and beef land to forestry - and the consequential impact on small rural communities, iwi/Māori, and the agriculture sector in general.

In the short term the additional contribution to these risks is minimal because of the relatively small marginal cost impacts to farming businesses with 95 per cent free allocation and the current level of carbon prices. It is proposed to maintain the 95 per cent free allocation through to at least 2025. The NZ ETS price is likely to rise above the current approximately \$25/tCO₂-e when the current \$25 fixed price option price ceiling is removed with effect from 2023 or when auctioning begins, if sooner. However, the announced introduction of a cost containment reserve to replace the fixed price option gives the government a continued ability to constrain the price of NZ ETS units.

In the long run these risks could become much more significant. The proposed joint Action Plan to prepare for a farm-level price signal from 2025 and the proposed feasibility reassessment and Parliamentary report in 2022 will need to comprehensively deal with the longer term risks.

Identify any significant incompatibility with the Government's 'Expectations for the design of regulatory systems'.

The NZ ETS has already established that pricing greenhouse gas emissions is consistent with the Government's 'Expectations for the design of regulatory systems'.

Section C: Evidence certainty and quality assurance

Agency rating of evidence certainty?

How confident are you of the evidence base?

There is a strong, consistent and by now well-established international policy and economics literature in support of comprehensive emissions pricing as a core component of climate change policy packages. The independent Interim Climate Change Committee provided a compelling report backed by good evidence and thorough analysis in support of its recommendation for the government to implement a staged approach to introducing a price on agricultural emissions.

Officials from the Ministry for the Environment and the Ministry for Primary Industries have worked together to further assess the evidence and conducted additional policy analysis (including commissioning further scenario modelling from Manaaki Whenua-Landcare Research (MWLR) to estimate agriculture sector responses to an emissions price, including land use change and revenue impacts). As a result, the Ministry for the Environment is confident of the overall weight of evidence in favour of the proposal.

The economic modelling suggests that emissions prices of around \$25/tCO₂-e with 95 per cent free allocation will result in marginal reductions in agricultural emissions and modest

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pass-through costs to farmers and growers. The Ministry considers the analysis of the impacts of the interim step of processor level emissions pricing is adequate and fit for purpose, given the limited initial impact expected over the period 2021-2025.

There are however limitations to the use of the scenario modelling undertaken to date for assessing realistic outcomes on longer timeframes post-2025. There are a range of possible transition scenarios whereby emissions prices rise or free allocation is reduced after 2025 and these could not be adequately modelled now. Also, because the modelling is based on current parameters it cannot fully take account of other significant factors that might change over the longer term.

There are also inevitably some gaps in the evidence base and areas that would benefit from further work, for example more detailed analysis of potential longer term social impacts on rural communities and regional economies, and better understanding of the combined impacts of freshwater and climate change policy.

Some of these matters will be able to be identified and addressed through the proposed joint Action Plan with the agriculture sector and iwi/Māori. The long term impacts will be able to be better assessed in detail through the proposed report in 2022 to confirm the feasibility and clarify the core design features for the farm-level pricing scheme.

Quality Assurance Reviewing Agency:

This Regulatory Impact Assessment (RIA) was reviewed by a Quality Assurance Panel comprising representatives from the Ministry for Primary Industries, Ministry for the Environment, and the Treasury Regulatory Quality Team.

Quality Assurance Assessment:

The Panel considers that the RIA meets Cabinet's Quality Assurance criteria.

Reviewer Comments and Recommendations:

As a part of its assessment, the Panel also considered the Interim Climate Change Committee's report, Landcare Research's modelling report prepared for the Ministry for Primary Industries, a supplementary cost-benefit analysis done by the Ministry for the Environment, and a selection of stakeholder submissions.

The Panel notes that while the nature of the policy area means that the analysis can be complex, the analysis is sound.

The Panel considers the summary section of the RIA should have included more discussion of the potential net benefits of options for a farm-level scheme. Analysis of this is covered in the Committee's report and Landcare Research's modelling, and in the RIA's multi-criteria analysis, but a clear upfront summary would have aided clarity and improved confidence in the potential of a farm-level scheme. The potential viability of a farm-level scheme is an important element in deciding whether to have an interim scheme.

Notwithstanding the consultation the Interim Committee had already undertaken, the Panel notes that the four weeks' consultation period was unusually short. While comprehensive submissions were provided by a wide range of organised interest groups, the short period would have inhibited submissions from some individuals. It will be important for officials to consult further during implementation of the interim approach, whether this is the processor-level scheme or the industry agreement. Consultation will also be key to understanding the impacts of the farm-level scheme.

Impact Statement: Agriculture emissions policy decisions

Section 1: General information

Purpose

The Ministry for the Environment is solely responsible for the analysis and advice set out in this Regulatory Impact Statement, including the work undertaken jointly with the Ministry for Primary Industries, except as otherwise explicitly indicated. This analysis and advice has been produced for the purpose of informing:

- key (or in-principle) policy decisions to be taken by Cabinet
- final decisions to proceed with a policy change to be taken by Cabinet.

Key Limitations or Constraints on Analysis

The scope of this regulatory impact assessment was effectively set by the Government tasking the Interim Climate Change Committee (ICCC) to provide the significant body of evidence, analysis and recommendations in their 30 April 2019 report *Action on Agricultural Emissions*.¹¹

The ICCC's report provided detailed regulatory analysis of whether, when and how to bring in an emissions pricing scheme for agricultural emissions. This included the assessment, and eventual rejection, of a number of options including direct regulation and voluntary alternatives to a price instrument.

Inevitably there were some limitations to the ICCC's work in dealing with the full land use and economic complexity of the New Zealand agriculture sector. Limitations in relation to available data, modelling tools and assessments of wider impacts were all acknowledged in the report, its technical appendices, and the underlying consultant reports. In particular, the ICCC identified three areas where more work is desirable:

- Likely consequences on rural land values and profits
- More detailed implications for rural employment demographics and social services
- Identifying communities and population groups most vulnerable to rural change.

A wide range of options for both short term and long term methods of pricing emissions as well as the alternative approaches of voluntary or direct regulation, have now been considered, both by the ICCC and officials. Inevitably other options or variations would be possible, however the sufficiency of the option set is evidenced by the fact that many could effectively be discarded on basic grounds of lack of effectiveness or cost.

The New Zealand Labour Party-New Zealand First Coalition Agreement states that if agricultural emissions are included in the NZ ETS, agriculture will be given 95 per cent free allocation.¹² This commitment has been factored into the analysis and built into the preferred interim option as free allocation of 95 per cent at processor (aggregate output) level until 2025. This means the agriculture sector will only be exposed to 5 per cent of the total costs of its emissions.

¹¹ <https://www.iccc.mfe.govt.nz/what-we-do/agriculture/agriculture-inquiry-final-report>

¹² <https://www.parliament.nz/media/4486/362429780labourandnewzealandfirstcoalitionagreement.pdf>

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Officials expect that due to the competitive nature of consumer markets for agricultural products, processors would pass through all their emissions costs up the supply chain to farmers and growers (on a simple averaged basis), rather than absorbing the costs or passing them forward in increased consumer prices. Many submitters shared this assumption, and were concerned by the level of costs that would be passed through, especially if the carbon price rises.

As set out in section B of the above Cover Sheet, the short term impacts of an interim step of introducing a price on emissions at processor level with a carbon price of around \$25/tCO₂-e and 95 per cent free allocation have been calculated and model-based estimates made of average effects on the earnings of different classes of agriculture enterprises at a range of carbon prices, and of the extent of the corresponding economically optimal land-use changes.

For the purposes of this quantitative analysis, simplifying assumptions have been made on carbon pricing pathways, and on the levels and durability of free allocation.

The assessment of the interim processor NZ ETS option also assumed that, while costs would be passed through, the price signal would not be passed on in a differentiated way that would recognise and reward specific emissions reductions activities at farm level.

Existing arrangements whereby dairy processors incentivise specific environmental, animal welfare and other business practices through differentiated incentive schemes suggest that it might be possible for a processor level NZ ETS obligation to be passed on in a more nuanced way. However, throughout the consultation and as evidenced by their submissions, affected parties at both farm and processor level and other sector organisations were consistently of the view that the blunt processor level price signal would not be meaningfully passed on to provide a differentiated price signal at farm level that would enable farmers and growers to directly benefit from their individual improvements in reducing emissions.

Further analysis is needed on a range of topics, including free allocation methodologies.

Conceptually there are a number of different ways in which a high level of free allocation can be recycled to the agriculture sector, with different implications for the marginal price signal faced by agriculture sector emitters. The method of free allocation could evolve over time, and in the long run the rate of free allocation is most likely to be reduced.

Due to the inherent uncertainty over future decisions relating to free allocation, these long term implications could not be specifically identified or assessed in detail.

Neither the short run or long term economic impact on the specific individual circumstances of the around 20,000 to 30,000 different agricultural businesses can be reliably calculated, and there are limits on the ability of the relevant economics and agricultural science disciplines to make comprehensive forecasts of exactly how the policy would play out in terms of detailed land use change, changes in agricultural business models and practices, and overall social, environmental and economic impacts in New Zealand.

Further analysis of the long term emission reduction options will need to be undertaken. The introduction of farm-level pricing of agricultural emissions from 2025 would be likely to have significant impacts in the long term.

Final decisions on agriculture emissions pricing are subject to a report in 2022 to confirm the feasibility and clarify the core design features for the farm-level pricing scheme.

Responsible Manager (signature and date):



Roger Lincoln
Director, Climate Change
Ministry for the Environment

Date: 06/09/19.

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Section 2: Problem definition and objectives

2.1 What is the context within which action is proposed?

The global climate is warming

1. There is a high risk that warming of the global climate system will result in catastrophic environmental events such as an unprecedented increase in sea levels if global temperatures continue to rise at current rates compared to pre-industrial levels.
2. Some of the effects of climate change are already being reported, for instance increased frequency of extreme events such as droughts and floods. New Zealand is already beginning to experience significant costs and disruption from previously 'locked in' climate change¹³. With future temperature rise New Zealand can expect warmer overall temperatures, sea level rise, reduced rainfall in the east, and increased rainfall in the west. We can also expect an increase in the severity and frequency of other extreme events, including winds, droughts, and floods.
3. A changing climate increases economic costs. The costs of climate change-related floods and droughts in New Zealand were estimated at a total of \$840 million over 2007-2017.¹⁴ These costs are expected to increase due to enhanced development in areas vulnerable to climate change.

The global community is taking action

4. The 2015 Paris Agreement represents a global commitment to avoid dangerous climate change by aiming to:
 - keep global average temperature rise to well below 2°C above pre-industrial levels, and pursuing efforts to limit temperature increase to 1.5°C
 - enhance countries' ability to adapt and reduce vulnerability to climate change impacts
 - make finance flows consistent with low-emissions and climate-resilient development.
5. It differs from the previous Kyoto Protocol international climate change agreement by requiring more ambitious targets to be set each round. In 2016 New Zealand signed and ratified the Paris Agreement.
6. The 2018 Intergovernmental Panel on Climate Change (IPCC) special report¹⁵ concluded that in scenarios consistent with staying within 1.5°C of warming, as set out under the Paris Agreement, with limited or no overshoot:
 - Global emissions of carbon dioxide (CO₂) would need to reduce to net zero around 2050, and then below zero (negative) thereafter;
 - Global emissions of agricultural methane would need to reduce by between 24-47 per cent from 2010 levels by 2050, and then stabilise thereafter; and
 - Expressed together using the 100 year Global Warming Potential equivalence metric (GWP100), global greenhouse gas emissions would need to be cut by between 81-93 per cent from 2010 levels by 2050.

¹³ NIWA data suggests New Zealand has already experienced an approximate 1°C temperature increase over the past 100 years. <https://www.niwa.co.nz/our-science/climate/information-and-resources/nz-temp-record/seven-station-series-temperature-data>

¹⁴ Frame, D. et. al. 2018. Estimating financial costs of climate change in New Zealand. Available at: <https://treasury.govt.nz/sites/default/files/2018-08/LSF-estimating-financial-cost-of-climate-change-in-nz.pdf>

¹⁵ The 2014 Intergovernmental Panel on Climate Change's synthesis report

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New Zealand is part of the global response, and can play a leadership role in reducing global agricultural emissions

7. As a small country contributing less than 0.2 per cent of global emissions, New Zealand seeks an effective, collective response to climate change, and participates actively in the international climate change negotiations under the United Nations Framework Convention on Climate Change (UNFCCC).
8. In 2011, the Government gazetted a domestic target to reduce New Zealand's emissions by 50 per cent below 1990 levels by 2050. In 2016, under the Paris Agreement, New Zealand committed to a Nationally Determined Contribution (NDC) target of reducing emissions by 30 per cent below 2005 levels by 2030.

New Zealand's domestic climate change policy settings

9. New Zealand already has a legal and policy framework in place to address climate change, including the Climate Change Response Act (CCRA) 2002. The CCRA established the New Zealand Emissions Trading Scheme (NZ ETS) in 2008, the main lever for incentivising emissions reductions across the economy. The NZ ETS works by requiring surrender of New Zealand Units (NZUs) per tonne of carbon dioxide equivalent and by providing NZUs for carbon sequestered from forests.
10. The NZ ETS currently covers almost all emissions from fossil fuels, industrial processes and waste, amounting to 52 per cent of New Zealand's gross emissions. It also gives credits for eligible afforestation, with corresponding obligations for deforestation. The remaining 48 per cent of biological emissions from agriculture were to be brought into the scheme from 2013, but this was deferred indefinitely in 2012 due to concerns over the availability of viable mitigation options, cost impacts on the agriculture sector and stakeholder acceptability.
11. There are a wide range of other policies and programmes underway across a number of portfolios that are also achieving emissions reductions and enabling the transition to a low-emissions economy. These include:
 - increased government funding for innovation, research and redevelopment into low emissions technologies
 - establishing a Green Investment Fund to also encourage private investment into low emission technologies
 - the New Zealand Energy Efficiency and Conservation Strategy (with a focus on efficient and renewable process heat, efficient and low emissions transport, and innovative and efficient electricity)
 - the 100 per cent renewable electricity target (and strategy under development)
 - \$1.15 billion of transport funding redirected towards investment in public transport, rapid transit and walking and cycling
 - the electric vehicles programme (including proposals for vehicle emissions standards and a discount scheme for clean and electric cars)
 - Afforestation Grants and the One Billion Trees Programme.

The Climate Change (Zero Carbon) Amendment Bill aims to strengthen domestic policy settings and support a just transition

12. In May 2019 the Government introduced the Climate Change (Zero Carbon) Amendment Bill (ZCAB) to Parliament. The ZCAB aims to provide an enduring framework for the transition to a low-emissions and climate-resilient New Zealand. It also proposes the following emissions targets, consistent with limiting global temperature increase to 1.5°C:
 - Reducing all greenhouse gases (except biogenic methane) to net zero by 2050;

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- Reducing emissions of biogenic methane to 10 per cent below 2017 levels by 2030, and within the range of 24-47 per cent below 2017 levels by 2050.¹⁶
13. The biogenic methane target in the ZCAB recognises the different impacts of greenhouse gases on the atmosphere. While extremely potent in the atmosphere¹⁷, methane is a short-lived greenhouse gas (GHG) and does not necessarily need to be reduced to zero by 2050 to avoid contributing to additional global warming. However, nitrous oxide is one of the long-lived gases that must be reduced to net zero.
 14. The ZCAB also proposes that the new independent Climate Change Commission (the Commission) review the methane target by 2024.¹⁸

The pastoral sectors are the largest contributor to New Zealand's emissions profile

15. Biological emissions from the agriculture sector (methane and nitrous oxide) amount to 38,880 kilotonnes CO₂-e and are the largest sectoral contributor to New Zealand's emissions profile, making up around 48 per cent of New Zealand's official internationally reported emissions. Around 92 per cent of these agricultural emissions are methane and nitrous oxide emissions from livestock, and approximately 6 per cent from nitrogen fertiliser.¹⁹
16. Some 75 per cent of agricultural emissions are biogenic methane (a short lived GHG). Biogenic methane comes from animals (cattle, sheep, deer) as a result of animals digesting their food i.e., belching after eating grass²⁰. The amount of biogenic methane produced is dependent on quantity of feed consumed, which is determined by the type, age and weight of the animal, animal production, feed quality and the energy expenditure of the animal.
17. Around 22 per cent of agricultural emissions are nitrous oxide. Nitrous oxide is a long-lived gas (can stay in the atmosphere for around 120 years). A tonne of nitrous oxide is also 265 times more potent than a tonne of carbon dioxide. Nitrous oxide comes from urine and dung from grazing animals and the use of synthetic fertilisers.
18. The following figure gives a breakdown of biological agricultural emissions by gas and by the main farming sectors.

¹⁶ The methane targets are gross reduction targets and, therefore, cannot be met at the national level through offsetting emissions with forestry. However, this does not remove the opportunity or incentive for farmers and other land users to earn forestry units through the NZ ETS to help manage their financial liability if agricultural emissions are priced.

¹⁷ A tonne of methane is 28 times more potent than a tonne of carbon dioxide, over 100 years.

¹⁸ The Commission would consider a range of factors when reviewing the target including, the current science, the potential economic effects, and global action on climate change.

¹⁹ Two per cent are from other sources eg, field burning, liming and urea application

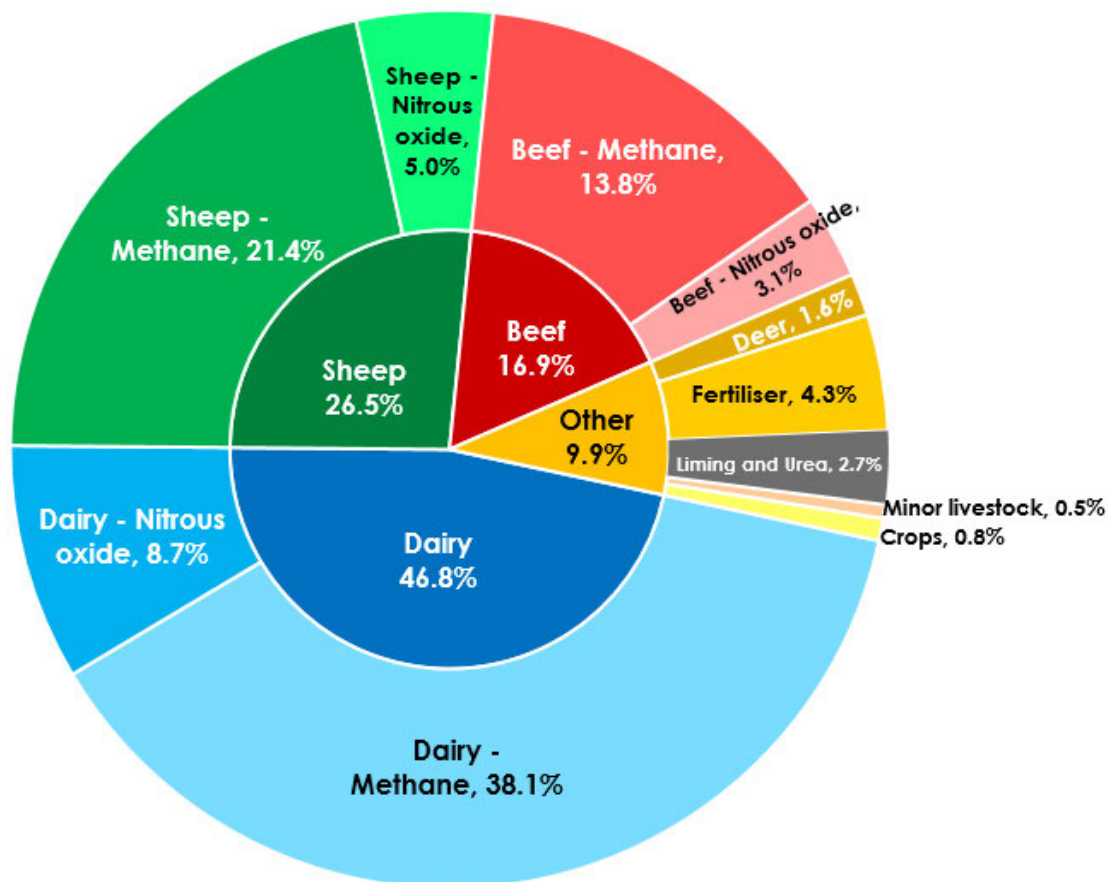
²⁰ Methane is a by-product of digestion in ruminants, for example, in cattle and sheep, and in some non-ruminant animals, such as swine and horses. Within the Agriculture sector, ruminants are the largest source of methane. The amount of methane released depends on the quantity of feed consumed, which is determined by the type, age and weight of the animal, animal production, feed quality and the energy expenditure of the animal.

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Figure 1 – New Zealand Agricultural Emissions Profile in 2017:

New Zealand Agricultural Emissions Profile in 2017

Percentage of total agricultural emissions



19. Between 1990 and 2017, New Zealand's total agricultural emissions increased by nearly 14 per cent, mainly due to an increase in overall agricultural production, responding to international demand.
20. The main drivers of change since are an increase in the application of synthetic nitrogen fertiliser of about 650 per cent since 1990 and a 92 per cent increase in the dairy herd.
21. The sector shares of agricultural emissions has changed over time. In 1990 emissions from sheep were 42 per cent and from cattle 34 per cent (just over half from dairy cattle and just under half from non-dairy cattle) of agricultural emissions. These shares have changed over time: by 2017, dairy sector emissions were 47 per cent of agricultural emissions, compared to 27 per cent due to sheep farming. Dairy cattle numbers have increased significantly. Absolute sheep and beef livestock numbers have declined since 1990, with a 52 per cent decrease in the sheep population and a 23 per cent decrease in the beef cattle population.
22. In order to be globally competitive, New Zealand's agricultural sector has made productivity improvements²¹ of approximately one per cent per annum since 1990. Without these improvements, biological emissions would have increased thirty to forty per cent more than they have from 1990-2017.

²¹ Such as improved feed and nutrition, animal genetic, reproduction rates and pasture management.

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Other sectors' emissions

23. New Zealand's gross emissions have increased 23 per cent since 1990. In 2017, the agriculture and energy sectors were the two largest contributors to gross emissions, at 48 and 41 per cent respectively.²² Emissions from all sectors of New Zealand's economy with the exception of methane and nitrous oxide from agriculture have faced a price on emissions since the introduction of the NZ ETS.

The agriculture sector is an important part of New Zealand's economy

24. The agriculture and horticulture sectors play a pivotal role in New Zealand's economy, and regional economies. For New Zealand's rural communities and regional economies the agriculture sector is an especially important source of jobs, wealth and wellbeing.

25. For the year ended June 2019, agriculture and horticulture exports are forecast to contribute an estimated \$39.4 billion.²³ In 2017, the primary industries accounted for 11 per cent of New Zealand's gross domestic product (GDP).

26. The agriculture and horticulture sectors are diverse, and the different parts of the sector face different challenges and opportunities. An overview of the sector is outlined below:

- The dairy industry

The dairy industry is New Zealand's largest export earner and contributed \$18.1 billion export revenue for the year ended June 2019. In 2016, the dairy industry employed around 48,000 people (33,700 on-farm production and 15,000 in processing). In 2018, there were approximately 6.4 million dairy cattle in 12,000 herds, across 1.7 million hectare.

- Meat and wool industry

The meat and wool sectors contributed \$10.1 billion export revenue for the year ended June 2019. The sectors employ over 66,400 people (30,900 production, and 35,500 in processing and marketing), and are made up of 27 million sheep, over 3.8 million beef cattle, and 850,000 farmed deer across 13,000 farms over 8.25 million hectares.

- Horticulture

Horticulture exports contributed \$6.1 billion year for the year ended June 2019. The sectors employ over 37,800 people (24,800 production, and 13,000 in processing and marketing). Key export crops and products include kiwifruit, wine, apples and pears.²⁴

27. The primary sectors are also a core component of the Māori economy, whose total asset base is estimated at over \$50 billion. Māori own 50 per cent of the fishing quota, 40 per cent of forestry, 30 per cent of sheep and beef production, 10 per cent of dairy production and 10 per cent of kiwifruit production.²⁵

²² New Zealand's Greenhouse Gas Inventory 1990-2017

²³ Situation and outlook for primary industries. Available at www.mpi.govt.nz/news-and-resources/economic-intelligence-unit/situation-and-outlook-for-primary-industries/sopi-reports/

²⁴ Ministry for Primary Industries. 2019. As above.

²⁵ Chapman Tripp. 2017. Te Ao Māori Trends and Insights. Available at <https://www.chapmantripp.com/>

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Addressing biological emissions will present challenges to iwi/Maori

28. Iwi/Māori land holdings are often owned collectively, which means decision-making takes longer. Furthermore, nearly 80 per cent of Māori land is of a less versatile land class, and many parcels of Māori land are small and fragmented. Sale of Māori land under Te Ture Whenua Maori Act is subject to several significant restrictions. Overall this means much iwi/Māori owned land has been underutilised for agricultural activities. This also means that in general, iwi/ Māori land owners are less able to be response to changes in future policies, and any additional costs from this could result in additional barriers for the continued development of their land.²⁶
29. The Crown also has wider duties of partnership and protection under the Treaty of Waitangi. There are broader iwi/Māori interests in climate change policy other than those arising directly from land ownership, including calls for greater ambition, particularly on targets and adaptation planning, as well as an expectation to see appropriate reflection of Te Tiriti o Waitangi principles and tikanga and mātauranga Māori. These views must also be considered alongside concerns from Māori primary sector groups and the potential distributional impacts of policies on Māori land use and development.

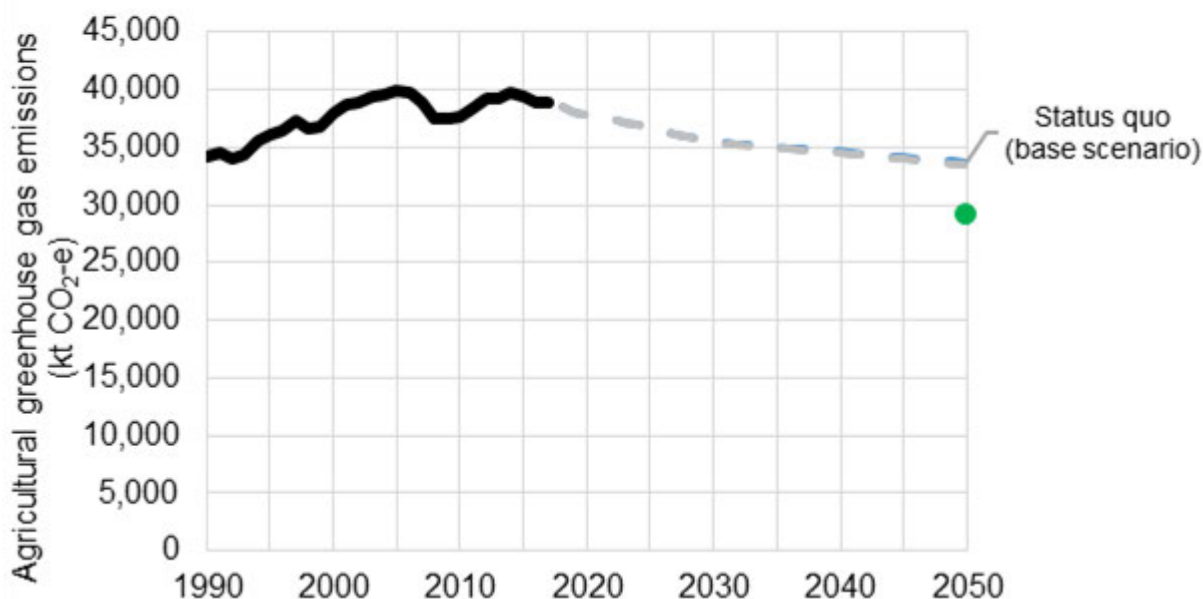
Status Quo/Counterfactual

30. Existing policies that regulate land use will impact on future levels of biological emissions. New Zealand regularly reports emissions projections for international reporting purposes, including the projected impacts of these land-use policies. The next set are still in preparation and are due to be reported by the end of 2019.
31. To determine a projected status quo for this regulatory impact analysis, MPI has provisionally modelled a one-off bespoke scenario of the projected biological emissions in 2050 relative to 2017 levels – ‘with current measures’. This scenario includes the assumed impacts of the following existing policies:
 - National Policy Statement for Freshwater Management (with some limitations as discussed below); and
 - Afforestation policies and programmes (including the Afforestation Grant Scheme, Erosion Control Programme, the One Billion Trees Programme and the NZ ETS).
32. This scenario also assumes the price of NZUs for afforestation and deforestation gradually rises to \$37.50 by 2050. However, as it is the status quo scenario, biological emissions are not priced.

Scenario	Description/notes
Status quo – base scenario	Includes the effect of freshwater policy (with the limitation discussed below), Afforestation Grant Scheme, Erosion Control Programme, the One Billion Trees Programme and the NZ ETS. Assumes an NZU price of \$37.50 by 2050 and no pricing of agricultural emissions
Current projections including other measures to directly or indirectly reduce greenhouse gas emissions	

²⁶ *Action on agricultural emissions – Evidence, analysis and recommendations*, Interim Climate Change Committee, 30 April 2019, page 12

Agricultural Emissions 1990 -2050 Status quo - base scenario



Note: The green dot shows approximately where 2050 agriculture emissions (methane and nitrous oxide) would be if there was a 24 per cent reduction between 2017 and 2050, ie. consistent with the less ambitious end of the proposed ZCB target range of 24-47 per cent reductions in methane from 2017 levels.

Impacts of the projected status quo

33. This scenario projects biological emissions to reduce by 12 per cent in 2050 relative to 2017 levels. The assumed cumulative impact of all these land use policies between 2017 and 2050 is:
- Dairy cattle population forecast to be 9 per cent lower
 - Beef and sheep populations forecast to be 28 per cent lower
 - Deer population forecast to be 10 per cent lower
 - Synthetic nitrogen fertiliser use forecast to be 13 per cent lower.

New information about existing trends and the expected impact of other policies will impact future biological emissions

34. In this status quo counterfactual scenario we have assumed other policies, in particular freshwater policy, will impact levels of biological emissions from agriculture in 2050. Under the current National Policy Statement for Freshwater Management (NPS-FM) regional councils are required to set limits and rules that reduce contaminant discharges to freshwater. The Government is also considering further proposals to strengthen the NPS-FM.
35. However, the status quo scenario above has not accounted for potential changes in the impact of the periphyton bottom line (introduced as part of the 2014 amendments to the NPS-FM). Preliminary analysis of new data indicates that the scale of nutrient mitigation and land use change to meet the periphyton bottom line is likely to be significantly greater than anticipated in the status quo counterfactual scenario. Although the standards only apply to stony rivers, substantial nitrogen load reductions will be required across much of New Zealand, particularly agricultural areas such as Canterbury and Southland. Some of

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this can be achieved by best management practice but in many places it will require a more significant change in land use. There is currently no economic analysis of the costs of meeting the periphyton bottom line. This is in part due to the fact that Councils can choose how to meet bottom lines and, crucially, the time frames for achieving them.

2.2 What regulatory system, or systems, are already in place?

36. New Zealand already has a legal and policy framework in place to address climate change, including the Climate Change Response Act (CCRA) 2002, and the NZ ETS. The Government is currently amending the CCRA to provide the framework to accelerate the transition to a low emissions economy. Steps are also being taken to strengthen the NZ ETS to ensure it can better provide certainty, flexibility and incentives to participants.
37. The NZ ETS provides incentives for afforestation. As well as reducing New Zealand's net emissions by sequestering carbon dioxide, this also reduces agricultural emissions by encouraging land use change. Specific changes are being made to the NZ ETS to simplify and de-risk participation for forest owners. These changes are designed to further incentivise afforestation, and to increase the carbon stored by New Zealand's forests.
38. However, as noted earlier, the original intent to include agriculture emissions of methane and nitrous oxide in the NZ ETS has never been implemented.
39. The main government policies directed at agriculture emissions to date have focused on encouraging research and development into innovative solutions and low emissions technologies. Through Budget 2019 the government announced \$25 million investment over four years to support world-class research here in New Zealand and an additional \$8.5 million to the Global Research Alliance on Agricultural Greenhouse Gases to reduce and mitigate agricultural emissions, and help the agriculture sector deal with the effects of climate change.
40. There are also synergies where the pursuit of other policy objectives such as better management of freshwater resources and protecting biodiversity on private land, can have co-benefits in reducing greenhouse gas emissions or encouraging additional sequestration.
41. On-farm behaviour change is already happening across the country. The sector has made progress in the last decade to improve land-use outcomes, including measures to improve freshwater quality. As a result of these wider productivity and efficiency gains, the sector has also improved overall emissions intensity by an average of around one per cent per year. Without these measures, production growth could have resulted in a total agricultural emissions increase of almost 40 per cent (to 2014).
42. Some primary sector companies and industry organisations have also set their own targets, plans and strategies for reducing emissions and building resilience. Examples include Fonterra, Synlait and Beef+Lamb New Zealand.

2.3 What is the policy problem or opportunity?

There is insufficient action occurring to reduce agricultural emissions and cost-effectively meet New Zealand's climate change targets

43. Despite producing 48 per cent of New Zealand's GHG emissions, currently there is no targeted policy framework to drive agriculture emission reductions. Voluntary efforts to reduce emissions by individual actors (for example, farmers, growers and sector organisations) have not been, and are unlikely to be enough to drive mitigation efforts at the level needed to meet New Zealand's current and future climate change targets.

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44. Policy uncertainty about the role of the agriculture sector in meeting New Zealand's emissions targets has also been a barrier to strategic long term investments that would reduce agricultural emissions, eg. changing farm systems and business models.
45. New Zealand's 2030 NDC target is ambitious, and future targets under the Paris Agreement are required to increase that ambition over time. Not meeting emissions targets poses large risks for New Zealand: either a fiscal risk (if the Government chooses to meet the shortfall by buying international emission units), a reputational risk (if New Zealand is perceived in any way not to be on track to meet its international obligation), or a risk to economic development (if other sectors must make large emission reductions to ensure New Zealand meets its climate change targets).

New Zealand might be missing out on cost-effective mitigation

46. Indicative analysis from the Ministry for the Environment's modelling of marginal abatement cost curves and by the Biological Emissions Reference Group (BERG)²⁷ suggests cost-effective mitigation exists that is not being taken up by farmers and growers. For example, analysis for the BERG found that if there was widespread adoption of currently available mitigation options (mainly farm management practices) an approximately 10 per cent reduction in absolute biological emissions from pasture-based livestock is possible. The ability of many farmers to implement such practices varies widely, and will in some cases be limited by non-price barriers (such as lack of information, and adequate measurement and management tools).

The agricultural sector not doing its fair share to reduce biological emissions undermines a just transition to a low emissions economy

47. Every major emitting sector in New Zealand, apart from agriculture and horticulture, currently has a financial incentive to reduce emissions through the NZ ETS. There is debate around the amount of emission reductions the agriculture sector ought to achieve, given the relatively short amount of time methane contributes to warming while it is in the atmosphere, and the limited number of technologies available to reduce emissions. However, there is a wide-spread view that the agriculture sector ought to do more to help New Zealand reach its climate change targets to reduce the financial, economic and reputational burden faced by the rest of New Zealand.
48. If the agricultural sector does not start making contributions towards meeting New Zealand's climate change targets soon, there is a risk that all other sectors of the economy will need to make more sudden and costly transitions to a low emissions economy in the future. This could have significant negative impacts for New Zealand's economy, for Māori development, and for the prosperity of vulnerable groups or communities (particularly in the regions).
49. Consumer expectations about food quality and sustainability are also changing. Growing awareness of the potential negative environmental impacts of agriculture, including greenhouse gases emissions are likely to factor into global perceptions of acceptability and demand for products in the future.

What are the opportunities?

50. The main opportunities from introducing policies to address biological emissions from agriculture are:
 - increasing the incentive for the agricultural sector to reduce emissions to help New Zealand cost-effectively reach its climate change targets

²⁷ BERG was established in June 2016 with the aim of building a portfolio of evidence covering opportunities to reduce biogenic greenhouse gas emissions (methane and nitrous oxide) from New Zealand agriculture, their costs and benefits, and any barriers to their use. Members included representatives from agricultural sector organisations and government agencies. <https://www.mpi.govt.nz/protection-and-response/environment-and-natural-resources/biological-emissions-reference-group/>

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- supporting a more managed transition for the agriculture sector to reduce emissions (preventing negative impacts for New Zealand’s economy, and for the prosperity of vulnerable groups or communities)
- enabling New Zealand to improve its international reputation by making it more likely to reach its climate change targets and by leading the world on how to reduce agricultural emissions
- encouraging New Zealand farmers to have more sustainable business models, which would improve their social licence to operate and ability to sell products which are internationally competitive
- encouraging world-leading research and development of new agricultural emissions reduction technologies with export potential to other countries addressing their agriculture emissions.

Policy objectives

51. Decisions on the proposals covered by this regulatory impact analysis are in line with the following Cabinet-agreed All-of-Government Framework for Climate Change Policy [CAB-18-MIN-0218 refers]:

PILLARS	LEADERSHIP AT HOME AND INTERNATIONALLY	A PRODUCTIVE, SUSTAINABLE AND CLIMATE-RESILIENT ECONOMY	A JUST AND INCLUSIVE SOCIETY
NECESSARY OBJECTIVES	<p>To promote global action, we will:</p> <ul style="list-style-type: none"> • Create an enduring domestic institutional architecture • Reduce our emissions out to 2050 and beyond • Hold ourselves and other countries to account to meet international commitments, e.g. Paris Agreement • Secure a multilateral rules system that delivers action with environmental integrity by all countries • Stand with the Pacific to support the region’s climate action and resilience • Invest in globally significant research, strategic alliances and capacity-building in developing countries • Place primary reliance on domestic measures, while retaining options for international cooperation. 	<p>To ensure the optimal transition pathway, we will:</p> <ul style="list-style-type: none"> • Encourage innovation, diversification and the uptake of new technologies • Seek to fully understand the costs, benefits, risks and trade-offs of policy levers across the economy, society and environment • Identify the best-value opportunities to reduce emissions • Increase our international competitiveness by speeding up the decoupling of emissions from growth • Drive behaviour change via a range of policy tools, including regulation, education, price-based and support levers • Proactively adapt to ongoing climate change impacts and invest to build resilience across all hazards and risks. 	<p>To ensure a careful transition, we will:</p> <ul style="list-style-type: none"> • Consider the optimal speed and pathways for transition • Take early action where this prevents greater costs in the long run, also recognising the rights and needs of future generations and honouring existing Treaty settlement commitments • Support the transitional shift to lower emissions and resilient sectors, and recognise and mitigate impacts on workers, regions, iwi/Māori rights and interests and wider communities • Support those affected by climate impacts to adjust • Ensure information about climate change and its impacts is robust and accessible to aid decision-making.

52. Additionally, Cabinet agreed that New Zealand will:

- by the end of 2019, put in place the necessary enduring institutional architecture to enable a just transition to a net zero emissions economy, and
- by 2020:
 - demonstrate its commitment to leadership on climate change and promote global action to achieve the Paris Agreement’s temperature goal

IN CONFIDENCE

- be on track to meeting its first emissions budget under the proposed Zero Carbon Act.
53. For a productive economy and allocative efficiency across sectors of the New Zealand economy, incentives to emitters of agricultural emissions to reduce emissions need to align with incentives in place for rest of the economy to reduce emissions (or increase sequestration).
54. For a just transition, policy-makers need to be aware of potential distributional impacts and where these are considered undesirable (for equity reasons), either design out from the outset, or use complementary measures to address them and ensure a just transition.
55. There is inevitably some potential tension between the objective of allocative efficiency which in this case would require emissions rights going to those whose full value (social and private value) is highest, productive efficiency (which means the mitigation/or sequestration undertaken is the least cost mitigation/sequestration) and a just transition, which as an objective contains considerations of equity, adjustments costs to sectors and society and consideration of how and where transitional and final impacts fall, and/or can be ameliorated.

Assessment criteria for options, to test options against policy objectives

56. The All-of-Government Framework for Climate Policy has been considered in developing more specific objectives and criteria for assessing proposals to reduce agricultural emissions in New Zealand (in Table 1). Note criteria 1, 2, 3, 4 and 6 are the primary criteria as they address the problem definition and reflect government's priority of a just transition. Criteria 8 - satisfies Treaty of Waitangi - is a minimum condition of any priority. The other criteria (5, 7 and 9) are secondary criteria.

Table 1: Assessment objectives and criteria for the options in this RIA

Objective	Criteria to meet objective	Explanation of criteria
Increase the agricultural sector's ability to cost-effectively help New Zealand meet its climate change targets	1. Increases agricultural sector emissions reductions	<p>a) Financial incentive/behaviour change Increases financial or behavioural incentives for the agricultural sector to reduce their greenhouse gas emissions: either through changes to practices or by investing in lower emission technologies.</p> <p>b) Amount of emissions reductions towards targets Expected to make significant reductions to agricultural emissions overall, and towards each climate change target.</p>
	2. Cost-effective for the agricultural sector and the New Zealand economy	<p>The agricultural sector is encouraged to meet climate change targets in a way that is least cost to the New Zealand economy by:</p> <p>a) Allocative efficiency across the agriculture sector Allocates costs and benefits efficiently across the agriculture sector – enables businesses to choose the least cost way for them to reduce their emissions.</p> <p>b) Allocative efficiency across all the sectors Allocates costs and benefits efficiently across the New Zealand economy - enables businesses to choose the least cost way for them to reduce their emissions.</p>

IN CONFIDENCE

	<p>3. Enduring policy and investment predictability</p>	<p>a) Creates enduring policy This involves developing policy which has sufficient stakeholder buy-in (across the agricultural sector, across New Zealand, and across Government/Parliament) to be likely to endure over the long term (both over the 2021-2025 period and 2025-2050, or even longer).</p> <p>b) Creates investment predictability This involves sending clear signals to the sector, which can be acted upon to make investment decisions.</p>
<p>Support New Zealand's transition to a low emissions economy</p>	<p>4. Supports a just transition</p>	<p>The option should support the Government's "just transition", which involves:</p> <p>a) Having a well-managed transition Participants, groups, regions and sectors should be provided with adequate assistance and time to reduce their emissions.</p> <p>b) Avoiding unintended distributional impacts New Zealand and each sector's transition to a low emissions economy should not create unintentional inequities between groups, sectors and regions. If some distributional impacts cannot be avoided to make needed emission reductions, complementary measures should be put in place to address:</p> <ul style="list-style-type: none"> • Impacts on different stakeholders - sectors, regions, types of businesses. • Impacts on people of different demographics, income levels, iwi/Maori. • Impacts on particular regions, communities.
	<p>5. Efficient and effective for regulators</p>	<p>Implementation is feasible and relatively low cost/generates revenue by:</p> <p>a) Having minimal administration costs The costs for Government to implement the options should be small relative to the expected carbon benefit (converted to \$) to New Zealand.</p> <p>b) Generating revenue to cover costs Where possible Government costs should be kept low by generating revenue through collection of NZUs or contributions from the agriculture sector.</p> <p>[Admin costs can include establishing and running the new system for Government, regulatory oversight cost to Government of emissions measurement, verification, enforcement and compliance]</p>
	<p>6. Minimal costs for stakeholders</p>	<p>Costs associated with adhering to the new rules should be reasonable given the benefits/stakeholder's constraints:</p> <p>a) Minimal compliance costs Costs to adhere to administrative requirements should be reasonable.</p> <p>b) Minimal business costs Financial costs to individuals or businesses should be reasonable (i.e. given business bottom lines/profitability level/revenue available).</p>
	<p>7. Aligns with wider government priorities</p>	<p>The option should support or at least be consistent with other Government priorities, in particular:</p>

IN CONFIDENCE

		<p>a) Support other climate change priorities: It should support the Government’s wider suite of policies to reduce net GHG emissions i.e. NZ ETS changes, emission budgets and plans to meet emission budgets.</p> <p>b) Supports wider environmental policies. For instance, it should align with the Government’s freshwater policy (which will also have impacts on emission reduction efforts).</p> <p>c) Support other wellbeing and economic priorities: It should support the Government’s wider economic agenda (such as the update of its industry policy and focus on supporting the regions), and work to improve wellbeing and inclusiveness.</p> <p>d) Does not result in loopholes</p>
	<p>8. Satisfies Treaty of Waitangi and</p> <p>9. Supports Māori development</p>	<p>The options should support Māori development by being cognisant of specific Māori needs and upholding the Treaty of Waitangi.</p>

2.4 Are there any constraints on the scope for decision making?

57. The proposals and analysis in this RIA represent only one step in the on-going development of emissions pricing policies as a central plank of New Zealand’s response to climate change over several decades.

The key constraints on Ministerial decision-making are:

58. Ministers are of a mind that decisive government action (including more effective and comprehensive emissions pricing) is needed to progress the transition to a low emissions future without delay. This has been set out in the sequence of Cabinet decisions from the 100 day plan through to the Productivity Commission response.²⁸
59. The specific options examined in this RIA do not start from a blank page, but are the government’s response to the significant body of evidence, analysis and recommendations in the 30 April 2019 report *Action on Agricultural Emissions* by the Interim Climate Change Committee (ICCC).²⁹ Public consultation took place over 16 July-13 August based on a discussion document setting out the government’s response to the ICCC recommendations. The discussion document built off the analysis and range of options considered in the ICCC’s report, and essentially agreed in principle to the broad thrust of the ICCC recommendations and set out some modified options to address biological emissions from agriculture in the long term (from 2025 onwards), and short-term (2021-2025).
60. Some aspects would require legislation and there is only a small window of opportunity to include these in CCRA amendments being progressed through the House of Representatives in late 2019/early 2020. As a result the necessary policy development and analysis, including the preparation of this RIA, has had to proceed at a fast pace to meet the requirements of the legislative timeframes.

²⁸ <https://www.mfe.govt.nz/more/briefings-cabinet-papers-and-related-material-search/cabinet-papers/climate-change/100-day-plan>
<https://www.mfe.govt.nz/productivity-commission-report-government-response>

²⁹ The Interim Climate Change committee was asked by the Government to look into how to best manage reducing emissions from agriculture (including the option for putting a price on these emissions under the New Zealand Emissions Trading Scheme).

IN CONFIDENCE

61. The key policy interdependency is the range of other policy issues concurrently impacting on the agriculture sector, and in particular the current Essential Freshwater policy proposals and the Sustainable Land Use Package in Budget 2019.
62. There is evolving broad agreement to an overarching strategic vision for sustainable farming in New Zealand, with sector leaders articulating an intention to move to good environmental management practice in five years. The challenge is how to build a well-incentivised sustainable farm management system including:
 - widespread uptake of effective farm environment plans
 - better measurement and management tools at farm level
 - increased farm advisory capacity, capability and consistency.
63. Policy development and Ministerial decision-making across the range of policy issues currently impacting the agriculture sector is cognisant of and informed by this emerging consensus vision, and therefore constrained to be generally consistent with it.

2.5 What do stakeholders think?

Who are the stakeholders and what are their interests?

Major agricultural organisations

64. This includes levy group organisation, processors, various industry associations and a lobby organisation. Collectively they represent a vast majority of the agriculture sector. The policy will fundamentally change how emissions are managed, with the following implications:
 - i) Levy group organisations – their farmers may have a liability to report emissions
 - ii) Industry associations – representing processors who could possibly have a liability to report emissions
 - iii) Processors – could possibly have a liability to surrender emissions units
 - iv) The lobby organisation – Federated Farmers – represent their members who are farmers and could possibly have a liability to report emissions.
65. Many of the major agricultural organisation stakeholders are members of the Primary Sector Leaders Group who developed the Primary Sector Climate Change Commitment proposal.

Farmers and growers

66. These policies will significantly change farming and horticulture businesses as it is introducing a liability on emissions. This will have an effect on on-farm environmental and investment decisions.

Iwi/Māori

67. Iwi/Māori have significant interests in agribusiness and forestry, through both investment and settlement assets. Policies to address agricultural emissions could affect these investments, assets and interests in different ways.

Small agricultural emitters

68. The policy will have some effect on smaller agricultural emitters.

Agriculture professionals: research organisations, land advisors, and other agricultural businesses

69. The policy decisions to reduce agricultural emissions may result in an increase demand in advice about agricultural emissions and mitigation techniques.

Miscellaneous business

70. The policy could affect some businesses that have financial interests in the agriculture sector.

IN CONFIDENCE

Environmental non-government organisations (NGOs)

71. The environmental NGOs have an interest in policy decisions to reduce New Zealand's agricultural emissions contribution to climate change, and also other wider environmental effects of agriculture.

General Public

72. The general public have an interest in policy decisions to reduce New Zealand's agricultural emissions contribution to climate change. They also may have an economic interest as agriculture contributes 11% to New Zealand's GDP.

Regional and local councils

73. The policy decision to reduce agricultural emissions will impact farmers in their region. They also have an interest in reducing New Zealand's agricultural emissions contribution to climate change as they respond to climate events in their regions.

What consultation has taken place?

The Interim Climate Change Committee (ICCC)

74. As part of developing its recommendations, the ICCC convened an "Agriculture Challenge and Review Group"³⁰ which met nine times over the course of the inquiry to challenge its analysis and to provide sector knowledge. The ICCC also engaged broadly, meeting with over 600 individuals and over 200 organisations at over 300 meetings and workshops. This engagement included farmers and growers from around the country, primary sector organisations, Māori land owners, foresters, NGOs and bankers.

Consultation on the Government's proposals

75. The Government consulted on its proposal to address agricultural emissions from 16 July to 13 August 2019. Seventeen public information sessions³¹ and a webinar were held around the country and around 600 people attended these public meetings. Two technical workshops were also held with industry representatives and rural professionals to discuss technical details of the Government's proposals. MfE received 3956 submissions on this consultation.³²
76. Officials called key iwi/Māori partners and corresponded with a wider group of iwi/Māori, offering the opportunity for hui or a phone call with a policy expert; officials participated in two hui, with Te Rūnanga o Ngāi Tahu and representatives from Te Arawa. Nineteen submissions identified as from iwi/Māori were received. Of these, six written submissions were from iwi/Māori organisations (three were from different groups within Te Arawa).
77. Te Arawa requested a hui as part of the consultation process and the minutes of this hui have been included as a submission for the purposes of the analysis (effectively Te Arawa's Te Urunga o Kea contributed to two submissions). There were also submissions from Waikato-Tainui and Ngāi Tahu. While this is not a large number of iwi, these three iwi do represent a considerable proportion of Māori land and investment in agriculture. The Federation of Māori Authorities (FOMA) also made a substantial submission.
78. The submissions from Waikato-Tainui, Te Arawa Primary Sector Group, Ngāi Tahu, the Te Arawa Climate Change Group (Te Urunga o Kea) and FOMA all offered many detailed recommendations for future action. These points will be useful for ongoing policy and implementation work.

³⁰ Representatives in the group included Beef+Lamb New Zealand, Dairy Companies' Association of New Zealand, DairyNZ, Deer Industry New Zealand, Federated Farmers of New Zealand, Federation of Māori Authorities, Fertiliser Association of New Zealand, Fonterra, Horticulture New Zealand, and Meat Association.

³¹ Tauranga, Whangarei, Christchurch, Ashburton, Lake Karapiro, Hawera, New Plymouth, Napier, Gisborne, Wellington, Invercargill, Greymouth, Carterton, Palmerston North, Auckland, Nelson, and Dunedin.

³² A full summary of submissions has been prepared and will soon be made available on the MfE website

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79. There were no written submissions from the Iwi Leaders Group on Climate Change or from the New Zealand Māori Council (NZMC). Two members of the Iwi Leaders Group on Climate Change did however provide initial verbal feedback on the options and this has been included in this analysis.
80. There were 18 submissions from iwi/Māori in relation to the Zero Carbon Bill. The analysis of these submissions will also be used to inform ongoing agricultural policy work.

Which stakeholders share the Agency view of the problem and its causes?

81. All major agricultural organisations that submitted support taking action to reduce emissions. Key themes raised during consultation also included the importance of recognising farmers for their actions and an approach that will achieve emissions reductions, the role of New Zealand in a global context, the treatment of other sectors, the distributional impacts of policies and the diverse pressures on farmers.
82. The majority of iwi/Māori submissions emphasised the importance of partnerships with the Crown to support and develop Māori land and agriculture. Such a partnership was seen as vital to addressing the historical disadvantages face by Māori landowners, overcoming any of the disproportionate impacts on Māori related to agriculture's inclusion in the NZ ETS, and harnessing the existing potential of Māori land and resources. These are important considerations and should be considered as part of all key decisions.
83. Many submitters, particularly those from outside the agriculture sector believe that New Zealand has a leadership role to play for other countries. These submissions called for strong action to be taken to pave the way for the rest of the world to take similar action on their own agricultural emissions.
84. Stakeholder feedback on how the specific policy options consulted on would best address the problem and its causes is summarised following the description of the options.

Which stakeholders do not share the Agency's view³³ in this regard and why?

85. A large number of submitters, mainly from the agriculture sector, questioned the necessity of any action on agricultural emissions. These submitters argued that New Zealand contributes a very small amount to total emissions worldwide, and that New Zealand's agricultural sector is already functioning efficiently comparative to farmers and producers in other countries.
86. Many were of the view that farmers should be able to offset all of their emissions (including methane emissions) with sequestration occurring on their own farms. This view was most strongly advocated from within the agriculture sector, but was also held by a number of submitters from outside the sector.
87. There was more specific feedback on a number of the policy options from submitters with different views on the problem and causes consulted. This more detailed feedback is summarised following the description of the options.
88. A number of submissions, again mainly from the agriculture sector, challenged the international scientific understandings and global warming metrics that underpin the methane targets in the ZCAB and therefore the need to take measures to meet the targets.
89. There was a view that current science and metrics over-emphasise the contribution of methane to climate change by not adequately recognising its properties as a short-lived gas. Many called for New Zealand policy-makers to adopt and use alternative metrics that are being discussed in the scientific literature, but have not yet been fully reviewed or endorsed by the Intergovernmental Panel on Climate Change (IPCC). Several offered alternative views on the science of the carbon cycle, and pushed for greater recognition of soil carbon when considering agricultural emissions.

³³ The Agency's view and the supporting evidence and rationale is set out in preceding sections above, especially in sections 2.1 and 2.3

IN CONFIDENCE

90. A majority of farmers thought New Zealand's proposed 2050 methane target was too high, while environmental NGOs thought the target was too low.
91. A number of submitters considered many of the issues that the government is focusing on are irrelevant to climate change. Some stated that the grass on farms was sufficient to counterbalance any agricultural emissions.³⁴
92. There were also some submissions that denied either the existence or importance of climate change entirely.

Section 3: Options identification

3.1 What options are available to address the problem?

Summary of options

93. The tables below outline all the options identified and assessed. The analysis includes key findings from the extensive regulatory impact assessments in the ICCC report supplemented by further analysis carried out by officials and incorporating the results of the Government's consultation and officials' analysis of submissions.
94. The first table outlines the set of options for the long term (ie. that would apply from 2025 onwards). The second table contains the set of interim options (ie. that would apply from 2020/1-2025).
95. These timeframes reflect the ICCC assessment that it would take at least until 2025 to implement a farm-level incentive system. This distinction underpins the assessment of feasibility of different options in this RIA, as it did for the ICCC's work. The long term or ultimate policy is assessed first as it is the long-term policy that informs the development of the interim options. The broad long term and interim options in the first two tables are labelled with a combination of capital letters and numerals.
96. The third table outlines further detailed options relating to the immediate legislative issues raised by free allocation under interim option E1 (ie. processor level pricing via the NZ ETS). These more detailed sub-options relating to free allocation are labelled using lower case letters and numerals.
97. The options considered as viable by officials are set out in the middle columns of the respective tables. The tables also present other proposals that were considered, but subsequently discarded (the right-hand column in each case). All of the options in the 'Regulatory and non-regulatory options' category were discarded. Further detail on discarded regulatory and non-regulatory options is provided in Appendix A.
98. All the viable options are described in more detail in the next sections of text following the tables. Discarded pricing options are described in full in the ICCC report (see Technical appendix 3 of the ICCC report).

³⁴ "Grass takes up carbon dioxide from the atmosphere as it grows. Like carbon stored in trees, carbon in grass is released when harvested or eaten. The difference between grass and trees is that the carbon stored in grass is released every few weeks and so does not accumulate." ICCC report, page 22 - https://www.iccc.mfe.govt.nz/assets/PDF_Library/f15921453c/FINAL-ICCC-Agriculture-Report.pdf

IN CONFIDENCE

Options table 1: Long term options to address agricultural emissions

Agricultural emissions reduction long-term (2025 onwards)		
Emission reduction pricing options	Options assessed as viable	Discarded options
A: Farm level pricing	A1. Price livestock emissions at the farm level (NZ ETS/levy)	A2: Farm level pricing all emissions (i.e. livestock and fertiliser) A3: Farm level dual cap NZ ETS A4: Farm level methane quota system, and nitrous oxide in the NZ ETS
B: Processor pricing	B1. Price all emissions at the processor level (NZ ETS/Levy) B2. Price fertiliser emissions at the processor level (NZ ETS/levy)	B3: Processor level dual cap NZ ETS
Regulatory and non-regulatory options		
C: Good Management Practice	n/a	C1. Mandatory farm environment plans with prescribed good management practices
D: Direct regulation	n/a	D1. Farm input controls D2. Practice controls D3. Limits on emissions

Options table 2: Interim options to address agricultural emissions

Agricultural emissions reduction interim (2020/1 to 2025)		
Emission reduction pricing options	Options assessed as viable	Discarded options
E: Processor pricing	E1. Processor pricing via NZ ETS From 2021, equivalent to 95% free allocation, funds recycled to deliver a joint action plan.	E2: Processor pricing via levy E3: Processor level dual cap NZ ETS E4: Processor level fertiliser emissions pricing only (i.e. excluding livestock)
F: Formal sector-government agreement	F1. Formal agreement (programme of action resourced by industry)	F2: Full formal agreement (programme of action resourced by industry) included in legislation

IN CONFIDENCE

Options table 3: Options relating to free allocation under interim option E1 Processor level pricing via the NZ ETS

Processor pricing in the NZ ETS free allocation design details for agriculture		Discarded options
Emission reduction pricing options	Options assessed as viable	Discarded options
a Method for calculating free allocation	a1. Output-based approach a2. Proportional approach	a3. Allocations to farm-suppliers
b Timing of providing free allocation	b1. Provide and subtract free allocation from the total emissions obligation when those obligations are due.	b2. Emissions units can be allocated before emissions payment obligations.
c Phase down rate of free allocation	c1. Retain default 1% phase down rate and temporary suspension currently in the Act. c2. Retain default 1% phase down rate and temporary suspension currently in the Act but defer ability to remove temporary suspension until 2025	c3. repealing the temporary suspension (1% per annum would begin automatically) c4. aligning with the phase down rate for industrial allocation ³⁵ c5. repealing the phase down rate altogether
d Process for decisions on phase down of free allocation	d1. Commission advises on rate of free allocation in agriculture d2 Commission is not required to provide advice on rate of free allocation in agriculture	d3. Commission determines rate of phase down of allocations (no ministerial discretion) d4 Commission advises on activity-specific phase down rates (aligned with industrial allocation) d5 Commission is explicitly forbidden from advising on agriculture free allocation rates
e Adjustment of free allocation factors	e1. Update emissions factors regularly; and update allocative baselines regularly through secondary regulations e2. Update emissions factors regularly; and set allocative baselines to update automatically through primary legislation e3. Update emissions factors regularly; and do not update allocative baselines regularly	e4. fixing emissions and allocation factors through primary legislation

Description of long term options to reduce agricultural emissions (2025 onwards)

99. This section considers the most effective, long-term options for reducing agricultural emissions (2025 or later). These are the options set out in options table 1 above. Options for interim measures are considered in a later section.
100. Separating the analysis in this way keeps options on the table that may be preferred in the long-term but would otherwise be discarded due to implementation challenges in the short term. Long-term is defined as by or after 2025. This is the length of time the ICCC considered would be needed to develop and implement farm-level emissions pricing (the most complex of the long-term policy options identified).

³⁵ Cabinet decisions this year propose for a 1% per year from 2022-30; 2% per year from 2031-40; and 3% per year from 2041-50. These changes are expected to be put to Parliament through an Amendment Bill in 2019.

IN CONFIDENCE

101. Officials discarded many of the options not recommended by the ICCC for the same reasons as set out by the ICCC in their report. This includes:
- *Mandatory farm environment plans*: Although desirable and critically important for overall management of environmental especially for water, on their own they are not an effective way to ensure emissions will reduce in line with climate change targets.
 - *Limits on agricultural emissions*: This approach is economically inefficient for the agriculture sector because with a limits-based approach, each farmer would have to achieve the prescribed outcomes on their own farm regardless of how expensive it is for them to do so. Some farmers could make greater reductions at low cost but have no incentive to do so if they are already below the limit.
 - *A dual cap ETS and a methane quota system with nitrous oxide in the NZ ETS* due to the greater complexity of those systems, and therefore greater administration and transaction costs for farmers, as compared to other options. In the case of the methane quota with nitrous oxide in the NZ ETS, farmers would be working under two separate systems. In the case of dual cap ETS farmers would be navigating two different prices for their farm level emissions
 - *Pricing fertiliser emissions at the farm level*: discarded as it would be more costly to implement than at the processor level, and currently the only way to manage, measure and recognise fertiliser emissions reductions is to use less fertiliser. Therefore, the incentive for farmers to reduce fertiliser emissions is the same whether these emissions are priced at the farm level or at the fertiliser manufacturer/importer level, with the cost passed to farmers. If fertiliser emissions were included in a farm level scheme it would result in approximately 5000 additional participants with no gain in incentives. Fertiliser emissions management, measurement and reporting techniques may improve and this option could be reviewed in future. When this option would be reconsidered is detailed in the assessment of option B2 (pricing fertiliser emissions at the processor level) below.
102. Officials undertook further analysis, in addition to that of the ICCC, of the options of mandatory farm environment plans and direct regulation before discarding these options. Additional analysis to support the decision to discard mandatory farm environment plans and direct regulation is provided in Appendix A.
103. The viable options described below are high level because officials will undertake further analysis to determine the detailed settings and report their findings to Parliament in 2022.

Emission reduction pricing options

104. If a price was placed on agricultural emissions, the scheme would need to define who is responsible for reporting and paying for these emissions directly. The entity responsible for paying for emissions is referred to as the “point of obligation”. This entity is responsible for collecting data on activities, reporting this information, and paying for the associated emissions.
105. For agricultural emissions, there are two options for the point of obligation:
- Farm-level: would involve 20,000-30,000 farmers. “The term ‘farmer’ could refer to either the land owner, stock owner, or business owner, although stock owner is unlikely to be a practical option.” This includes around 5000 horticultural and arable growers.
 - Processor level: would involve 150-200 processors. “The term ‘processor’ is used to refer to dairy processors, abattoirs or live animal exporters in the case of ruminant livestock, and fertiliser manufacturers or importers in the case of nitrogen fertiliser.”
106. Both point of obligation options could be implemented as either a tax or levy on products, or by including livestock emissions in the NZ ETS. Officials agree with the ICCC that in the long term, both options could be feasible.

IN CONFIDENCE

107. Recommendations on the preferred mechanism for pricing agricultural emissions will be included in a report to Parliament in 2022, alongside other detailed design advice.

A: Farm level pricing

108. Four options for farm level pricing were identified. Three of these options (dual cap NZ ETS/methane quota system and pricing fertiliser emissions at the farm level) were discarded for the reasons set out above. The remaining option that was assessed is described as follows:

Option A1 Farm level pricing livestock only via NZ ETS or levy (preferred)

109. Farmers would be responsible for emissions from livestock (biogenic methane and nitrous oxide) produced on their farms. They would not be responsible for emissions generated by fertilisers.
110. Under this option, livestock emissions would be priced at farm level from 2025. This means farmers:
- Would report to the Government and pay for these emissions, either by directly paying the Government (levy) or purchasing units to cover any liabilities (NZ ETS).
 - Could have a net financial benefit if their emissions were negative, ie. if the NZ ETS credits earned from their sinks (trees) and free allocation were greater than their emissions.
 - Would need to calculate their emissions annually using approved methods and taking account for any emission reduction actions taken.
111. As part of this option farmers could voluntarily report their emissions from 2023 and would be required to report their emissions from 2024.
112. Further design details of the farm level scheme would be determined in a Ministerial report to Parliament in 2022. Among other things, this report will consider the mechanism (ie. levy or NZ ETS unit surrender obligations), the method, rate and phase down of free allocation, the method for calculating on-farm emission and removals, and how methane might be calibrated relative to other greenhouse gases. This may include reconsidering some of the options previously discarded.

B: Processor level emissions pricing

113. Another option for emissions pricing is for the point of obligation to sit with the processor. Under a processor point of obligation, processors would need to continue to estimate and report on their emissions annually (they are already required to do so under the CCRA). They would then pay for these emissions, either by directly paying the Government (levy) or purchasing units to cover any liabilities (NZ ETS).
114. Three options for processor level pricing were identified. One option (processor pricing under a dual cap NZ ETS) was discarded because of the additional complexity compared to the NZ ETS or Levy, as a processor would be buying and selling two different units increasing the administration and transaction costs. Two options were assessed as described below. Option B1 is mutually exclusive with Option A1 – livestock emissions can either be priced at farm level or at processor level. Option B2 complements Option A1 - livestock emissions would be priced at farm level and fertiliser at processor level.

Option B1 Processor level pricing of all emissions (NZ ETS or levy)

115. Processors would be responsible for the emissions related to the products they process (or in the case of fertiliser, manufacture or import).
116. Processors already report their emissions under the NZ ETS.
117. This option means processors would:

IN CONFIDENCE

- report to the Government and pay for these emissions, either by directly paying the Government (levy) or purchasing units to cover any liabilities (NZ ETS)
 - calculate their emissions using a simple calculation of tonnes of product times emission factor.
118. Processors are likely to pass on most of the costs of an emissions price to farmers through lower pay-outs for milk or meat. This is likely to be passed on as a flat rate per unit of milk or meat (ie. regardless of the individual emissions footprint of farmers).
119. There are additional approaches that could be developed to help provide an incentive for farmers to take mitigation actions on their farms:
- *At farm level:* A price on emissions at the processor level could be complemented with a farm-level incentive scheme to reward early adopters who do reduce their emissions and maintain production. For example, farmers who reduced their emissions through changing on-farm practices could apply for a grant equivalent to the benefits of reducing those emissions.
 - *At processor level:* This option could allow for unique emissions factors to be developed. The ICCC provided the following note on this and explored it in their appendix 2:

“Processors could be given the option to apply for a lower ‘unique emissions factor’ that recognises that their suppliers emit less than the average. However, this would involve considerable effort for processors to prove that their suppliers have lower emissions than the national average. To get a unique emissions factor, processors would need data about these farmers’ on-farm productivity improvements and use of mitigation technologies to prove their emissions are lower than the national average. If successful in proving this, the processors emissions costs would be lower, and they could pass this on to their farmers.

This option may not be very feasible in the drystock sector in particular where farmers may frequently change processors. However, options exist to use other data that meat processors have available already such as the age of certain animals at slaughter, which could be used in the calculation of emissions at processor level.”

Option B2 Processor level pricing of fertiliser emissions via NZ ETS or levy (preferred)

120. Under this option, fertiliser manufacturers and importers would pay for the emissions associated with the products they manufacture or import (i.e. the emissions that will be released when the product is used).
121. This option would capture about six per cent of agricultural emissions. The predominant users of nitrogen-based fertilisers are dairy farmers and horticultural producers. Very few sheep and beef farms use nitrogenous fertiliser.

Stakeholder views on long term options to reduce agricultural emissions (2025 onwards)

Farm level pricing of livestock emissions

122. In general, farm-level pricing of livestock in the long term is supported across all stakeholder groups. There is general support from major agricultural organisations for a pricing mechanism being the best policy tool, but only if farmers are able to account for sequestration as well as sources. Federated Farmers was an outlier in this respect,

IN CONFIDENCE

making their support for pricing of agricultural emissions contingent on three conditions being met³⁶.

123. While the majority of regional council submissions support an on farm price, Waikato Regional Council does not. While they note some benefits of farm-level pricing, they also note the costs of implementation as a concern.
124. Smaller agricultural industry organisations believe they are already functioning at very low emissions and wish to be recognised for this success. They believe a farm-level approach would best achieve this. For example, New Zealand Wine oppose pricing at farm level as wine growers use of livestock is primarily incidental. They fear the cost and burden of having to adopt a scheme that they see as undue attention to a minor part of their operations. (Thresholds for participation had already been identified as an issue for further work in the 2022 review.)
125. A number of agricultural submitters supported a hybrid approach. Options included self-reporting, groups of farmers, processor reporting on behalf of their supplying farmer or farm advisors reporting on behalf of a farm. One submitter suggested retaining the processor point of obligation as a “backstop” (3320).
126. *Potential policy responses:* In the 2022 review, the Government could potentially explore options to address the following matters:
 - more flexible interpretation of what qualifies for NZ ETS emissions credits
 - the ability to offset methane using sequestration
 - consider the threshold for inclusion at farm level
 - a ‘hybrid’ style approach to pricing.

Processor level pricing for fertiliser

127. Overall, the majority of the agriculture sector organisations were opposed to a processor-level price for fertiliser emissions. The reason given for this “farmers need to consider the implications of nitrogen fertiliser use as part of their whole farm system’s emissions.” (Beef+Lamb). “Applying a single priced-based mechanism at the farm level will avoid misalignment and confusion, and enable costs to be more directly factored into a suite of these management options to reduce emissions overall for an efficient production system.” (DairyNZ).
128. Supporters of a processor level price for fertiliser include: Horticulture New Zealand (HortNZ) and all smaller emitting agricultural industries and Regional councils. HortNZ described conditions under which it could be beneficial to consider pricing at farm level for fertiliser. NZ Pork, New Zealand Wine, and Thoroughbred Breeders all identify as low fertiliser users, and sought to avoid the administrative cost and burden of carrying out farm-level pricing of fertiliser.
129. Individual farmers’ views on where to price fertiliser were mixed, as were environmental NGOs.
130. Some agricultural organisations³⁷ supported a hybrid approach where farmers have the choice about where the obligation sits. Options included self-reporting, groups of farmers, processor reporting on behalf of their supplying farmer or farm advisors reporting on behalf of a farm. Officials note that some irrigation schemes manage water quality matters in this way.
131. *Potential policy response:* The Government could commit to consider shifting the point of obligation for fertiliser to farm level as part of the 2022 review. Hybrid options could also be considered.

³⁶ A different metric for methane, cost effective mitigation options available, not disadvantaging international competitiveness

³⁷ Fertiliser Association, Ballance Agri-nutrients and Ravensdown

IN CONFIDENCE

Assessment of long term options to reduce agricultural emissions (2025 onwards)³⁸

ASSESSMENT CRITERIA	Status Quo	A Pricing livestock emission at farm level	B1 Pricing livestock emissions at processor level	B2 Pricing emissions from fertiliser at processor level
<p>1. Increases incentive to reduce agricultural emissions</p> <p>a) Financial incentive/behaviour change</p> <p>b) Amount of emissions reductions towards targets</p>	0	<p>++</p> <p>a) The method (and rate) of free allocation will have a significant impact on the incentives created by a farm level pricing scheme.</p> <p>No decisions on the method of free allocation have been made. This will be the subject of further work.</p> <p>For the purposes of this assessment two allocation scenarios were modelled – one where farmers face costs of 5% of their current emissions (proportional) and one where free allocation is provided on the basis of 95% of their historical emissions (decoupled).</p> <p>Using a proportional allocation method, at all carbon prices (\$25 and above), sheep and beef farms have an incentive to adopt some additional mitigation options compared to the status quo, such as removing breeding cows and planting woodlots. Dairy farms, however, are unlikely to adopt any mitigations even at high GHG prices (\$100/tCO₂-e). This option creates an incentive to move a small amount of pastoral land to lower emission uses (arable and horticulture). The relatively little land use change and low uptake of mitigation options is primarily due to farmers facing only 5% of the cost of their current biological GHG emissions</p> <p>Decoupling free allocation from current emissions increases the incentive to reduce emissions across all agriculture sectors. At the</p>	<p>+</p> <p>a) Pricing emissions at the processor level treats all farmers who supply processors the same, regardless of their individual emissions footprint. This does not recognise farmers who are reducing their emissions while keeping the same amount of production.</p> <p>In addition the only viable methods for free allocation are linked to current output, i.e. cannot be decoupled to create a stronger incentive as with farm level pricing.</p> <p>As with option A modelling suggests sheep and beef farmers have an incentive to adopt mitigation options at all carbon prices. However, this option does not encourage the dairy sector to adopt many mitigation options even at the highest GHG price (\$100 per tCO₂-e).</p> <p>Like option A, this option creates an incentive to move some pastoral land into lower emissions uses at all GHG prices.</p>	<p>+ / ++</p> <p>a) Farmers/growers would be incentivised to use less fertiliser, as the product would be marginally more expensive once the associated emissions are priced.</p> <p>Producers/importers of fertiliser that generates lower than average emissions could apply for a unique emissions factor for these products. This could provide an incentive for farmers/growers to purchase these products over higher emitting alternatives.</p> <p>Farmers will also need to overcome knowledge barriers around how to use fertiliser most effectively</p> <p>b) While soil type and moisture can impact how much nitrous oxide is emitted – this relationship is not yet well understood and cannot be reliably quantified. Until that difference can be quantified there is no difference in the incentive of pricing fertiliser emissions at the processor level compared to farm level.</p> <p>In the future, if verifiable practices and mitigation technologies are developed, the Government could reconsider switching this to a farm-level obligation.</p>

³⁸ Quantified impacts in this table are based on scenario modelling conducted by Manaaki Whenua –Landcare Research (MWLR). A summary of the modelling approach can be found in Appendix B

IN CONFIDENCE

		<p>highest GHG price modelled (\$100/tCO₂-e), the dairy area declines by about 17% while sheep and beef area decreases by around 16%. The forestry area increases by up to 80% (1.8 million ha), as there are payments for carbon sequestration.</p> <p>Farm level pricing could also drive increased investment of commercialisation of novel technologies to reduce emissions which were not modelled.</p> <p>b) Assuming 95% proportional free allocation and a \$25 carbon price, total agricultural GHG emissions decrease by 0.3% (120,000 tonnes CO₂-e) per year and by 12.5% per year at a \$100 carbon price, compared with the baseline.</p> <p>Using a decoupled free allocation method, expected emission reductions would be greater at 2.5 million tonnes (6% of total agricultural GHG emissions) at GHG prices of \$25 tCO₂-e and 14.4 million tonnes (35% of total agricultural GHG emissions) at a \$100 carbon price, compared with the baseline.</p> <p>Work on the further detail of the farm level scheme will explore the levels of free allocation/emissions prices needed to reach proposed targets in the Zero Carbon Bill.</p>	<p>b) Total agricultural GHG emissions are reduced by 0.3% (106,000 tonnes) per year at \$25 per tCO₂-e and 12.2% (5 million tonnes) per year at \$100 per tCO₂-e.</p>	
<p>Economically cost-efficient way for NZ to meet its climate change targets</p> <p>a) Allocative efficiency across the agriculture sector</p>	0	<p>+</p> <p>a) This option is potentially more cost-effective across the agricultural sector compared to option B1 as it could encourage on-farm practice improvements. Farmers would be able to choose the most economically efficient way to reduce their emissions, rather than be forced into reduced stocking rates or land use change. Some farmers may even earn more</p>	<p>- (sector) + (economy-wide)</p> <p>a) This option is not cost-effective across the agricultural sector as the only mitigation options are reducing production or changing land use.</p> <p>Modelling by MWLR³⁹ shows net agricultural and forestry revenue decreases by 0.4%</p>	<p>++</p> <p>Incentivises cost effective mitigation of fertiliser emissions (eg. through efficient fertiliser use or use of fertiliser with an inhibitor).</p> <p>Farmers reduce emissions as far as it makes financial sense for them to do so given the emissions price.</p>

³⁹ Manaaki Whenua – Landcare Research

IN CONFIDENCE

<p>b) Allocative efficiency across all the sectors</p>		<p>revenue as some mitigations require improved productivity. Farmer uptake of cost-effective mitigation options (for example, improving farm management practices) will depend on how farmers respond to price signals. There are also information barriers that any policy package would need to address. It is intended that the recycling of funds raised through emissions pricing is used to support the development of farm environment plans including a climate change module and farmer advisor services.</p> <p>b) Modelling indicates that with 95% free allocation on a proportional basis net agricultural and forestry revenue falls by 0.5% (\$47 million) at a \$25 carbon price and by 1.2% (\$132 million) at a \$100 carbon price. Without free allocation this would result in a reduction in net revenue of approximately 20% (\$1.15 billion) at a \$25 carbon price and by 66% (\$3.7 billion) at a \$100 carbon price. Decoupling of free allocation results in a 0.2% increase in overall net revenue. This results from shifts to more profitable horticultural, arable and forestry land uses, and also the 95% revenue is assumed to be recycled independently of land use.</p>	<p>(\$32 million) at \$25 tCO₂e⁻¹ and by 0.9% (\$94 million) at \$100 tCO₂e⁻¹, compared to the baseline scenario.</p> <p>b) More cost-effective across NZ economy to achieve climate change targets.</p> <p>MWLR modelling suggests this option achieves similar mitigation to farm-level pricing with 95% free allocation at each of \$25, \$50 and \$100 tCO₂e, but less mitigation at each price compared with pricing at farm-level where allocation is decoupled.</p>	
<p>Provides durable regulatory certainty and predictability</p> <p>a) Creates enduring policy</p> <p>b) Creates investment predictability</p>	<p align="center">0</p>	<p>+ (enduring policy) 0/+ (investment certainty)</p> <p>a) This incentive is likely to be more acceptable to sector participants than option B1 because it would give greater control to farmers to make decisions about how to meet their obligations. Therefore it is likely to be more enduring than the option B1 and potentially the status quo.</p>	<p>– (enduring policy) + (investment certainty)</p> <p>a) Unlikely to generate stakeholder buy-in, so policy may not endure.</p> <p>b) Increases investment certainty as businesses (and banks) will factor the emissions price when making decisions. However, this incentive is very limited as it doesn't relate to on-farm</p>	<p>+</p> <p>a) Given nothing can be done to demonstrably reduce emissions from fertiliser other than to use less, this option is likely to be durable and acceptable, regardless of the point of obligation chosen to price livestock emissions.</p> <p>b) Increases investment certainty as businesses will factor in the emissions price when making business decisions.</p>

IN CONFIDENCE

		<p>b) This option increases investment certainty as businesses (and banks) will factor in the emissions price when making decisions. However given decisions on the design details of the scheme, including the method and rate of free allocation have yet to be determined and will have significant impacts on the costs of the scheme for individual businesses, there will be some investment uncertainty until those decisions are made.</p>	<p>efficiencies and given 95% free allocation the likelihood of the costs affecting farm profitability is low.</p>	
<p>Supports a just transition:</p> <p>a) Having a well-managed transition</p> <p>b) Avoiding unintended distributional impacts</p>	<p>0</p>	<p>+ (managed transition)</p> <p>- (distributional impact)</p> <p>a) Would support early emissions reductions from the agricultural sector, reducing the risk of a need to make large reductions quickly later. The rate and method of free allocation (to be determined) can slow the pace of change to avoid significant social impacts in rural communities.</p> <p>b) This option could create distributional issues because of the interactions between emissions pricing and the underlying profitability of different farming sub-sectors. Modelling indicates that sheep and beef and deer farms are more strongly incentivised to change land use, with potential flow on impacts for some rural communities.</p> <p>Final distributional impacts will depend in particular upon future decisions on free allocation. For example, the ICCG recommended a hybrid method of free allocation to try and balance the incentives to improve emissions intensity and not increase production. Rules on eligibility for free</p>	<p>+ (managed transition)</p> <p>- (distributional impact)</p> <p>a) Would support early emissions reductions from the agricultural sector, reducing the risk of a need to make large reductions quickly, later. Future decisions – namely on free allocation could be designed to ensure gradual change rather than shocks.</p> <p>b) As per option A, this option could create distributional issues because of the interactions between emissions pricing and underlying profitability of different farming sub-sectors. However free allocation methods will not create the same potential for distributional impacts compared with farm level options as the price signal will largely be muted and does not vary significantly across farms. Under this option the deer sector is unlikely to have mitigation options apart from</p>	<p>0</p> <p>Unlikely to require other policies to support a just transition</p>

IN CONFIDENCE

		<p>allocation are also still to be decided and will need to ensure rules do not disproportionately affect Māori land owners.</p> <p>Distributional impacts will also be dependent on future decisions on water quality regulations, and how and when Regional Councils implement action plans to meet bottom lines. Some regions and sectors maybe required to change farm practices and land use more than others and therefore may face higher costs than those who only need to face this new price.</p>	<p>stock reduction available (and it has a comparatively high GHG emission factor (21 tCO₂e⁻¹ per tonne of venison)). In addition, farmers (particularly in the dairy sector) making mitigation contributions from reduced per stock emissions intensities or from novel farm practices (likely dairy farms) would not be rewarded, whereas those reducing stock numbers, and establishing forests would.</p> <p>Similar impact as option A regarding other water quality regulations.</p> <p>Final distributional impacts will depend upon future decisions on wider complementary measures</p>	
<p>Efficient and effective – for regulators</p> <p>a) Having minimal administration costs</p> <p>b) Generating revenue to cover costs</p>	<p align="center">0</p>	<p>-- (admin cost) + (revenue from NZUs)</p> <p>a) Set up and annual administration costs to Government will ultimately depend on the final scheme design. However, annual administration costs will likely be higher than the status quo and option B. There would also be additional set-up costs compared with a simpler system.</p> <p>Annual administrative costs are estimated between \$20 million to \$120 million per annum across agencies, depending on the design of the scheme - a system involving a more complex farm-level allocation method will involve higher administration and compliance costs, especially as there is more likely to be lower compliance rates.</p>	<p>-(admin cost) + (revenue from NZUs)</p> <p>a) Set up and annual administration costs are likely to be much lower than option A.</p> <p>Initial set up costs so agriculture participants can receive free allocation and surrender obligations Withheld under s9(2)(f)(iv)</p> <p>Ongoing annual administrative costs Withheld under s9(2)(f)(iv)</p> <p>Emission factors for processors will need to be consulted on and updated. This will require</p>	<p>-(admin cost) + (revenue from NZUs)</p> <p>a) Would increase admin costs compared to status quo.</p> <p>b) Revenue generated would be proportional to fertilisers' share of emissions</p>

IN CONFIDENCE

		<p>b) At 95% free allocation at a \$25 carbon price this option will generate around \$40m per annum from NZUs.</p>	<p>additional sector and government resources.</p> <p>b) This option will likely generate around \$40-50 million per annum (= 1.6 million NZUs x \$25 carbon price).</p>	
<p>Minimal costs -for stakeholders</p> <p>a) Minimal compliance costs</p> <p>b) Minimal business costs</p>	<p>0</p>	<p>-- (compliance) -- (business)</p> <p>a) Participation costs to farmers are subject to the final scheme design. However, compliance costs will be higher than the status quo and likely higher than for other options. The ICCC estimated costs between \$80 per annum (for a simple scheme) to \$900 per annum, which may reduce to \$400 per annum over time (for an Overseer based scheme).</p> <p>b) Business costs to farmers will increase by between \$6 per hectare per year (for sheep and beef farmers) to \$14 per hectare per year (for dairy farmers) assuming a \$25 carbon price.</p> <p>Total costs to the agriculture sector are estimated at \$52m per year.</p>	<p>-- (compliance) -- (business)</p> <p>a) This option will have very small additional compliance costs for processors compared to the status quo and option A (as processors are already reporting emissions to the EPA⁴⁰). There will likely be low compliance costs to farmers as processors are expected to simply pass costs through.</p> <p>b) Farmers and processors will have increased business costs of approximately \$40-\$50 million per year compared to the status quo and option A from having to buy NZUs.</p> <p>Processors are likely to pass on most of the administrative and business costs to farmers through lower pay-outs for meat or milk, and increased prices for nitrogenous fertiliser.</p>	<p>--</p> <p>a) and b) likely increased costs for farmers compared to the status quo as it is likely that manufacturers will pass the cost of this option onto farmers through price increases to fertilizer.</p>
<p>Aligns with wider government priorities</p>	<p>0</p>	<p>+</p> <p>a) Aligns with Government agenda to cost-effectively reach climate change targets and to</p>	<p>+</p> <p>←-Similar to Option A</p>	<p>0/+</p> <p>Compared to the status quo, this option is likely to support other Government priorities such as</p>

⁴⁰ Administrative cost to processors likely relatively small compared to emissions reductions achieved- BECA's analysis for the Biological Emissions Reference Group found processors would face costs of around \$2 million per year (from calculating and reporting their emissions.), however some stakeholders have said these would be higher.

IN CONFIDENCE

<p>a) Support other climate change priorities</p> <p>b) Supports wider environmental policies</p> <p>c) Support other wellbeing and economic priorities</p>		<p>help NZ move to a lower emissions economy compared to the status quo.</p> <p>b) Compared to the status quo, reducing agricultural emissions is likely to support other Government environmental priorities such as improving water quality. This is because many mitigation options also improve water quality (planting trees, reducing stock numbers).</p> <p>c) The amount of land use change is dependent on the rate and method of free allocation, which is yet to be determined. However, it is likely to result in increased forestry, horticulture and arable farming in regions currently focused on sheep and beef farming⁴¹. This could provide a boost to NZ's economy and wood processing sector (by increasing wood supply, though many logs may be sold without much processing).</p> <p>It will increase jobs in the forestry and horticulture sector, but could also reduce jobs in the sheep and beef sector by a similar amount (more analysis before 2022 on this net impact required). Forestry jobs and some horticulture jobs also tend to be seasonal and can involve commutes from the city (rather than sheep and beef jobs which are year round and permanently in the regions)⁴².</p> <p>The interactions with measures to implement different government priorities (eg. water) could however result in relatively higher associated costs for some sectors, which could impact the Government's economic development plans. Regions with pre-existing vulnerabilities such as high unemployment, low incomes, workers that have barriers from</p>		<p>improving water quality. This is because fertiliser runoff can reduce water quality.</p>
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⁴¹ Reward for carbon removal from forests not the price on agricultural emissions was thought to be a greater determinant of land use change

⁴² Seasonal low paid work tends to attract migrant workers.

IN CONFIDENCE

		<p>changing career, lack of community leadership or resources (including volunteerism) could be disproportionately impacted.</p> <p>Further analysis is required to better understand the potential impacts on rural communities. This will be undertaken as part of work to determine the design details of the scheme.</p>		
Supports Maori development	0	<p>The impacts of this policy option on Māori landowners will depend in particular upon future decisions on the method and rate of free allocation. Rules on eligibility for free allocation are also still to be decided and will need to ensure rules do not disproportionately affect Maori land owners.</p> <p>Notwithstanding this, Māori land characteristics (including ownership structures, governance and physical land characteristics) reduce the ability of many iwi/Māori land owners to respond to policy in a timely way to minimise risk and maximise opportunities for efficient land use and land use change (by in this case changing landuse or farm system)⁴³ In particular their land holdings tend to be small/fractured (comprised of many small blocks - each under separate land titles)⁴⁴, and lower quality (sheep and beef and forestry classes of land, rather than dairy – a lot of forestry land also planted before 1990-so ineligible for carbon credits). This can make it difficult for Māori landowners to finance new developments.⁴⁵</p> <p>While, governance structures such as trusts and boards, and land managers (including the Māori trust office) help to effectively manage the land, it takes</p>	0	0
			<p>Given 95% free allocation, the impacts on all landowners including Maori should not be significant.</p>	<p>Given 95% free allocation, the impacts on all landowners including Maori should not be significant.</p>

⁴³ *Action on agricultural emissions – Evidence, analysis and recommendations*, Interim Climate Change Committee, 30 April 2019, page 12

⁴⁴ There is approximately 1.4 million hectares of Māori land (5% of New Zealand) concentrated in the mid to upper North Island. The average Māori land block is 52 hectares with 100 owners. Some blocks have more than 1,000 owners.

⁴⁵ In order to overcome the regulatory and other barriers to the sustainable development of Māori land, a new cross-government Whenua Māori programme was launched in February 2019 including proposals for legislative amendments and improved information and advisory services for Māori land owners

IN CONFIDENCE

	<p>time for land owners to collectively agree on actions This means they may not change to lower emissions land uses when it is economic to do so (face a financial burden, other stakeholders can more easily mitigate).</p> <p>Nevertheless, many Māori and iwi-run organisations and businesses already practise kaitiakitanga and are actively thinking about how to be more sustainable. –</p> <p>Being ahead of the curve in reducing emissions could see new business opportunities emerge for Māori and pave the way for others to follow.</p> <p>Critical to enable key iwi/ Māori stakeholders to participate in design decisions for this option as Crown partners .</p>		
<p>Overall assessment</p>	<p>For options concerning livestock emissions officials support option A because it is most effective at addressing the problem definition and capitalising on the opportunities. It will create an incentive to reduce agricultural emissions to meet New Zealand's climate change targets and do so as part of a just transition. However this needs to be subject to further analysis through the 2022 report into detailed design and feasibility implications, to ensure that the accumulated impacts of other policies (for example water regulation) and the administrative costs of this option are not prohibitively high.</p> <p>While a number of agriculture stakeholders were opposed to pricing fertiliser emissions at the processor level, officials support pricing fertiliser emissions at the processor level from 2025 as the best way to incentivise emissions reductions from fertiliser use at lowest cost to participants and the Government. However, this point of obligation should be reviewed again in the future if science advances such that there are other verifiable options at the farm-level for reducing fertiliser usage.</p>		

Key:

<p>- worse than doing nothing/the status quo</p>	<p>0 about the same as doing nothing/the status quo</p>	<p>++ much better than doing nothing/the status quo</p>
<p>-- much worse than doing nothing/the status quo</p>		<p>+ better than doing nothing/the status quo</p>

IN CONFIDENCE

Description of interim measures to reduce agricultural emissions

132. This section considers the most effective interim measures that are feasible to implement in 2020 or 2021. The intention is that these policies would help prepare the sector for an on-farm emissions price in 2025.
133. It is considered that Option E1 and Option F1 are mutually exclusive. There is significant overlap in the two options regarding the need for the sector, iwi/Māori and Government to work together to deliver a workable and effective farm level scheme between now and 2025. However, the formal sector-government agreement that is considered in F1 has been put forward by the Primary Sector Leaders Group as an alternative to processor level pricing, not as an agreement to complement it.

Option E: Interim processor level pricing

134. Four interim options for processor level pricing were identified. Three options were discarded. Processor pricing via a levy was discarded as it would be more costly and take more time to implement compared to pricing through the NZ ETS (as the EPA already has processors in its ETS systems and there is already a legislative framework for the ETS). Processor pricing under a dual cap NZ ETS was discarded because it is more complex and has greater administration and transaction costs than a single cap NZ ETS.
135. Processor pricing of fertiliser emissions (excluding livestock) was discarded as imposing a disproportionate cost on only a small part of the agriculture sector (eg. horticulture) would not support the just transition and would generate a very small amount of emissions reductions.

Option E1: Interim processor pricing via the NZ ETS (preferred)

136. Processors would be responsible for the emissions related to the products they process (or in the case of fertiliser, manufacture or import). Processors would need to estimate their emissions annually and report to the Government. They would then pay for these emissions by purchasing units to cover any liabilities.
137. Processors would receive 95% free allocation. Any funds collected by the government would be used to deliver a Joint Action Plan. The purpose of the Joint Action Plan is to build the necessary on-farm systems and capability to support farm-level pricing from 2025, including:
 - a climate change module in any requirement for integrated farm plans
 - tools for estimating emissions at the farm level
 - increased farm advisory capacity and capability
 - incentives for early adopters
 - recognition of on-farm mitigation (e.g. small plantings, vegetation).
138. A governance group comprising government, iwi/Māori and the agriculture sector would oversee the spending of the funds and the implementation of the Joint Action Plan.

Option F: Formal sector-government agreement

139. Following the release of the IPCC report, the Government received a proposal from leaders of the agriculture sector titled “He Waka Eke Noa: Primary Sector Climate Change Commitment” that sets out a draft five-year programme of action before 2025.
140. The purpose of this draft programme is to establish the foundation to support behaviour change necessary to reduce farm emissions and progress to an emissions price at the

IN CONFIDENCE

farm level by 2025. This would involve the agriculture sector organisations and government agreeing to:

- a programme of action to support farm emissions reductions and progress for implementing farm-level pricing
- industry resourcing and funding to a level necessary to implement the programme of action (including the reprioritisation of existing levy body funds of \$25 million per annum over the five-year period).

141. The sector's proposal includes a commitment from agricultural leaders to work with the Government to design a pricing mechanism at the farm level by 2025 – where any price is part of a broader framework to support on-farm practice change, is set at the margin and only operates to the extent necessary to incentivise the uptake of economically viable opportunities that bring about lower global emissions.

142. Two options for a formal sector-government agreement were identified. The option of having the full agreement included in legislation was discarded as it would be very difficult to draft and unlikely to be legally enforceable.

Option F1: Formal sector-government agreement

143. This option would involve the development a formal sector-government agreement, based on the Programme of Action outlined in *He Waka Eke Noa: Primary Sector Climate Change Commitment*. The figure below describes the proposed programme of action in more detail.

Summary of Agriculture sector leaders' proposed programme of action to 2025

- Delivering a system for estimating and benchmarking farm-level emissions.
- Rolling out integrated Farm Environment Plans covering emissions reductions, offsets and adaptation for all farms by 2025.
- Building climate change knowledge of farm and rural professionals.
- Increasing investment in research and development to expand the tool box and technologies available to farmers to calculate and reduce their emissions.
- Engaging with the One Billion Trees programme to enhance on-farm carbon sinks to offset farm emissions (consistent with a right tree, right place approach).
- Developing strategies for climate change adaptation on farms.
- Working with the Government to develop appropriate pricing mechanisms.
- Demonstrating leadership globally to encourage momentum on agricultural emissions reductions.

144. Officials consider the formal sector-government agreement could be expanded to include a commitment from Primary Sector Leaders to:

- accept or support pricing emissions from 2025, whether or not it is feasible at the farm level
- co-governance of the programme of action with representation from iwi/Māori, government and the agriculture sector (including co governance of funds)
- set out and cost a five-year programme of action and detail where additional sources of funding will come from if shortfall is identified. The programme of action should also reflect milestones of voluntary emissions reporting by 2023 and mandatory emission pricing by 2024, and detail specific funding programmes to support Maori landowners.

145. Alongside this agreement the Climate Change Response Act could be amended to require an annual review of progress to implement the Agreement and a regulation

IN CONFIDENCE

making power to bring in a processor level pricing scheme by Order in Council at any time prior to 2025 in the event that the Agreement and its key milestones were not met.

Stakeholder views on Interim measures to reduce agricultural emissions

Emissions pricing at the processor level through the NZ ETS

146. Almost all environmental NGOs, several iwi groups, and some agricultural professionals and technical organisations supported a processor-level price scheme as an interim policy measure. Submitters preferred this option noted that it provided a stronger incentive for behaviour change than a formal-sector agreement, there was more certainty of meeting emissions reduction targets, it puts a meaningful price on agricultural emissions now, and it generates more funding (compared to option F) to support the sector.
147. Te Arawa Climate Change Group, Waikato-Tainui and Ngāi Tahu all supported this option because the formal government-sector agreement “has less certainty and therefore creates further intergenerational burden” (Te Arawa Climate Change Group).
148. A majority of agriculture sector submitters, including agricultural organisations, opposed this option. Primary concerns raised were: processors will focus on ETS trading to reduce liabilities rather than on-farm practical action; option E seen as a blanket ‘tax’ or ‘revenue gathering exercise, which would do little to motivate positive action or early adoption and risk long term farmer engagement; and many sector organisations feared that, once emissions were priced at processor level, this price would remain at the processor level.

Formal sector-government agreement for reducing emissions

149. A large majority of the agriculture sector organisations, several Māori organisations, landowners and farmers, and some local government submitters supported a formal sector-government agreement as the preferred interim measure. Submitters preferred this option because it could encourage innovative and practical on-farm action that would drive change in reducing emissions; efforts from the sector, iwi/Māori and Government would be focused on delivering the systems, knowledge and infrastructure needed to deliver farm-level pricing; and it would be potentially less expensive and quicker to implement.
150. Small and large Māori landowners or farmers, as well as FOMA and Te Arawa Primary Sector Group, supported this option as it this included the space to develop “a programme of action to support farmers to reduce on-farm emissions and industry resourcing to implement this programme” (Te Arawa Primary Sector Group). FOMA voiced support for Option F because they stated that shifting to lower-emissions farming requires an approach to farming that shifts from volume to value. They stated that achieving this will require a partnership approach between the Crown, Māori and the industry.
151. Submitters that opposed this option noted concerns that there is no regulatory or financial onus on the industry to reduce its emissions; this option does not address matters of responsibility and enforceability in the event that significant emissions reductions does not occur; and some feared that the industry would resist or delay effective action.

IN CONFIDENCE

Assessment of Short term/transitional agricultural emission reduction options (2021-2025)

ASSESSMENT CRITERIA	SQ	Option E Processor level ETS 95% free allocation Action Plan with ag sector	Option F Sector/Government Agreement 5 year programme of action +Legislative milestones
<p>Increases agricultural sector emissions reductions</p> <p>a) Financial incentive/behaviour change</p> <p>b) Amount of emissions reductions towards targets</p>	0	<p>+</p> <p>a) As per option B, this option creates a financial incentive to reduce emissions (mainly by reducing stock levels as per stock costs would increase). It would lead to some incentives to reduce emissions through increased awareness, information and tools. Because this is an interim option only, processors are unlikely to invest in processes that differentiate the emissions price that is passed on to their suppliers, based on the mitigation actions farmers take up. As a result, farmers/growers would face the same emissions price, whether they take action to reduce emissions or not.</p> <p>b) As per option B, modelling suggests this option could deliver emission reductions of around 120,000 tonnes of CO₂-e per year (or a 0.3% reduction on the baseline scenario) if emissions are priced at \$25/tCO₂e and with 95% free allocation. Together with carbon sequestered by land use change into forestry this results in about 1.3 million tonnes of carbon towards the 2030 NDC target.</p>	<p>0/ +</p> <p>a) As per option E, this option would provide some incentive to reduce emissions through increased awareness/information and tools.</p>
<p>Cost-effective for the agricultural sector and the NZ economy</p> <p>a) Allocative efficiency across the agriculture sector</p>	0	<p>++</p> <p>a) This option could increase awareness and lead to increased uptake of tools that could lead to cost effective mitigation that is currently not occurring. It also incentivises changes that reduce production, but not practices that reduce emissions intensity. Therefore farmers may reduce stocking</p>	<p>+</p> <p>a) Increased awareness/information and tools could result in the take up of some cost-effective mitigation that is currently not occurring.</p>

IN CONFIDENCE

<p>b) Allocative efficiency across all the sectors</p>		<p>rates or potentially make land use changes to reduce emissions when more cost effective emission reductions could be achieved through on farm efficiencies.</p> <p>b) This option is more cost-effective across the NZ economy to achieve climate change targets.</p>	
<p>Enduring policy and investment predictability</p> <p>a) Creates enduring policy</p> <p>b) Creates investment predictability</p>	<p>0</p>	<p>0 (enduring policy) + (investment certainty)</p> <p>a) This option is unlikely to generate stakeholder buy in, so there is a risk of policy settings not remaining stable over the 5 year period. It could also risk undermining policy durability of pricing at the farm level by 2025 as sector participants may be reluctant to work constructively towards this if they think the Government is imposing unjustified costs on them. However, it could provide an incentive for the sector to work constructively to enable the implementation of a farm level scheme to avoid a continued price at the processor level. This option generates \$40-50 million in funds that will support the implementation of infrastructure needed for farm level pricing from 2025. It could also increase buy in through implementing a governance board involving government, sector representatives and iwi/Maori to oversee the fund and implement a Joint Action Plan for a farm level scheme.</p> <p>b) The option will increase investment certainty as some businesses (and banks) will factor in the emissions price when making decisions (i.e. on stock numbers). However, this incentive is very limited as it does not relate to on-farm efficiencies and given 95% free allocation and the limited impacts on farm profitability is unlikely to be a key driver of investment decisions over the short term.</p>	<p>0/+ (enduring policy) 0 (investment certainty)</p> <p>a) More likely to generate stakeholder buy-in to the long term objective of a farm level scheme, so could endure over the 5 year period and help ensure the sector works constructively on farm level emissions pricing by 2025 . This view came out strongly in consultation – for example: “Support, goodwill and commitment from the rural community will be essential if seeking to rapidly implement behaviour change to achieve ambitious GHG targets.”(Fertiliser Association, page 11). However, it does not send a clear signal that action is needed to reduce emissions quickly and could be seen as a way to further delay policy decisions on emissions pricing. The sector has committed \$25 million/year to deliver a programme of action and committed to “explore options for raising additional funding if required, under a co-investment approach with government.</p> <p>b) Compared to the status quo this option does not increase investment certainty to factor emissions prices into business decisions in the short term (i.e. bank ROIs and businesses bottom lines).</p>

IN CONFIDENCE

<p>Efficient and effective for regulators</p> <p>a) Having minimal administration costs</p> <p>b) Generating revenue to cover costs</p>	<p align="center">0</p>	<p>- (admin cost) + (revenue from NZUs)</p> <p>W [REDACTED] it [REDACTED] h [REDACTED]</p> <p>b) This option will generate more revenue to implement farm level pricing than option F (around \$40-50 million per annum = 1.6 million NZUs x \$25 carbon price) so likely that less additional resource will need to be provided by government.</p>	<p align="center">-</p> <p>a) Administrative costs likely to be smaller than option E as there is no need to set up a new system.</p> <p>b) More likely the agreement will generate less funds that can be used to prepare for 2025 farm level pricing than option E (and Government will need to cover more of these costs). The sector has committed \$25 million/year to deliver a programme of action and committed to “explore options for raising additional funding if required, under a co-investment approach with government. However, levy bodies can only increase levies if majority of levy parties agree. There is a risk that attempts to increase levies to cover any additional costs will not be supported by farmers.</p>
<p>Minimal costs for stakeholders</p> <p>a) Minimal compliance costs</p> <p>b) Minimal business costs</p>	<p align="center">0</p>	<p align="center">-</p> <p>a) Small additional compliance costs for processors compared to the status quo as processors are already reporting emissions to the EPA. Although some processor submitters did note that they would need additional skills and capability to engage with the ETS if this option was chosen.</p> <p>b) Processors will have increased business costs from having to buy NZUs (estimated at \$40-50 million for total agriculture sector). Processors are likely to pass most of this cost on to farmers. Funds raised would be recycled back into programmes to deliver work programme for farm level pricing.</p>	<p align="center">0</p> <p>a) No additional administration costs as uses existing funds/existing mechanisms to raise funds.</p> <p>b) Could result in additional costs to businesses if current funding not sufficient to deliver work programme and levy bodies seek increase to commodity levy to cover costs.</p>

IN CONFIDENCE

<p>Supports a just transition:</p> <p>a) Having a well-managed transition</p> <p>b) Avoiding unintended distributional impact</p>	<p align="center">0</p>	<p align="center">++</p> <p>a) This option would support early emissions reductions from the agricultural sector, reducing the risk of a need to make larger reductions more quickly later.</p> <p>b) 95% free allocation slows the pace of change to avoid significant social impacts on farmers and rural communities.</p>	<p align="center">+</p> <p>a) Higher likelihood of slower transition to low emissions economy compared to option E – as potential for no incentive to invest in lower emissions technologies and practices to reduce agricultural emissions over the short term (i.e. if agreement fails), so there is higher risk of more rapid emissions reductions being required after 2025.</p> <p>b) Potential for the sector to manage distributional impacts in setting up measures to price emissions at the farm level in 2025, but also possible certain interest groups will negotiate a better deal for themselves.</p>
<p>Aligns with wider government priorities</p> <p>a) Support other climate change priorities</p> <p>b) Supports wider environmental policies</p>	<p align="center">0</p>	<p align="center">++</p> <p>a) Aligns with wider climate change policies to reduce GHG emissions. Subject to ensuring free allocation is provided at the same time as total obligations are due, and the scheme is not misaligned with current changes to improve the ETS.</p> <p>b) Opportunity to incorporate alignment with water quality policy – in particular farm environmental plans – in development and delivery of action plan to implement farm level pricing by 2025. Incentive to reduce emissions through reduced production aligned with a shift in government priorities toward production value over production volume.</p>	<p align="center">+</p> <p>a) Opportunity to incorporate alignment with water quality policy – in particular farm environmental plans – in development and delivery of programme of action to implement farm level pricing by 2025. Incentive to reduce emissions through reduced production aligned with shift in government priorities toward production value over production volume.</p>
<p>Supports Māori development</p>	<p align="center">0</p>	<p align="center">+</p> <p>See analysis in long term table above</p> <p>Critical to enable key iwi/Māori stakeholders to participate in design decisions for this option as they are Crown partners in any action plan.</p>	<p align="center">+/-</p> <p>See analysis in long term table above</p> <p>Critical to enable key iwi/Māori stakeholders to participate in negotiations and design decisions for this. Iwi/submitters have signalled strong preference for interim processor pricing (option E) rather than a sector agreement (this option F). However, a number of Māori commercial land use interests including FOMA supported a sector government agreement</p>

IN CONFIDENCE

Overall assessment	<p>MfE prefers option E, but the trade-offs between the options make this a finely balanced choice. Processor pricing through the ETS would ensure the agriculture sector will bear some of the burden of helping New Zealand reach its climate change targets as soon as possible. But it could also reduce goodwill in the sectors to help New Zealand develop a long term option for reducing agricultural emissions. In contrast, the formal agreement with the agriculture sector could help to gain the buy-in needed to help prepare for the long term option to price agricultural emissions. However, the sectors are likely to bear less of the cost New Zealand faces to meet climate change targets over the interim (less funding is included in the agreement than could be gained processor pricing). Not committing to implement a pricing tool for reducing emissions until 2025 could also provide less certainty to investors that the agricultural sector will face a cost for their emissions. However, there are a number of measures which could be used to mitigate the negative potential impacts of the two options. These could include commitments by the Primary sector leader to:</p> <ul style="list-style-type: none"> • accept or support pricing emissions from 2025, whether or not it is feasible at the farm level • co-governance of the programme of action with representation from iwi/Māori, government and the agriculture sectors (including co governance of funds) • set out and cost the 5 year programme of action and detail where additional sources of funding will come from if shortfall is identified. The programme of action should also reflect milestones of voluntary emissions reporting by 2023 and mandatory emission pricing by 2024 and detail specific funding programmes to support Māori landowners. <p>In addition it will be important to build into legislation an annual review of progress and the ability to switch on processor level obligations by Order in Council if key milestones are not being met.</p> <p>Officials recommend that the formal agreement sector-government option is not implemented unless these additional changes, which strengthen the agricultural sector’s commitment to preparing for 2025 pricing are also implemented.</p>
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Key:

<p>- worse than doing nothing/the status quo</p> <p>-- much worse than doing nothing/the status quo</p>	<p>0 about the same as doing nothing/the status quo</p>	<p>++ much better than doing nothing/the status quo</p> <p>+ better than doing nothing/the status quo</p>
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IN CONFIDENCE

Processor pricing in the NZ ETS: free allocation design details

152. This section considers options for free allocation if agricultural emissions are included in the NZ ETS at the processor level as an interim measure (option E1). The method, rate and phase down of free allocation at the farm level from 2025 will be considered as part of further work, consultation and subsequent legislative changes after 2022 for the detailed design of the farm level mechanism. Recommendations for farm level free allocation will be included in the 2022 report to Parliament described in the long term options (from 2025).
153. Free allocation is where the government gives emissions units or money to an emitter at no cost. The purpose of free allocation can be to help ease the transition to a pricing mechanism, alleviate negative impacts from that pricing mechanism, avoid shocks to the regulated sector and wider economy, and protect against emissions leakage. The IPCC considered that “the main reason for agricultural allocation should be to help manage the social impacts of emissions pricing on farmers and rural communities, with emissions leakage risk as a lesser concern.”⁴⁶
154. Officials have assessed options for free allocation based on the Labour Party/NZ First Coalition Agreement. This agreement stated that if agricultural emissions are included in the NZ ETS, agriculture will be given 95 per cent free allocation.⁴⁷ This means the agriculture sector as a whole would be exposed to 5 per cent of the costs of all livestock and fertiliser emissions as valued in the NZ ETS markets.⁴⁸
155. Not all decisions about free allocation as part of the interim measure of processor level ETS will be made in this set of policy decisions by Cabinet. Further implementation details for free allocation of emissions units to processors, in particular setting emissions factors used to calculate the number of freely allocated units (allocative baselines) in regulations, will be the subject of further work.

Issue a: The method for setting free allocation

156. With a processor point of obligation, the Government would allocate each processor a quantity of emissions units.
157. Two viable options for setting free allocation for a processor point of obligation were identified: output-based and proportional approaches. The two approaches result in broadly similar incentives and expected cost impacts for processors. This is because in both cases, the processor’s total emissions and their level of free allocation are calculated based on production levels (emissions per kilograms of milk solids or meat or nitrogenous fertiliser sold).

⁴⁶ IPCC report, page 128

⁴⁷ Available at <https://www.parliament.nz/media/4486/362429780labourandnewzealandfirstcoalitionagreement.pdf>

⁴⁸ The agriculture sector is exposed to other emissions costs through their wider participation in the NZ ETS and flow-on impacts of the NZ ETS on their businesses (eg, the use of coal or gas in boilers, and petrol and diesel used for milk tankers already incur costs to the agriculture sector from the inclusion of these activities in the NZ ETS). In most cases, the point of obligation in the NZ ETS for these emissions sit upstream (eg, with the oil and gas company selling and distributing petrol and diesel), with these emissions costs being passed down to end-users (such as those in the agriculture supply chain). These costs are outside the scope of this RIA.

IN CONFIDENCE

158. Allocations do not have to be passed along to the same entity as where emissions obligations sit.⁴⁹ Officials discarded the option of allocating to entities other than processor-level [option a3 – allocations to farm suppliers], as this would require significant additional administrative and compliance costs with unclear and negligible advantages in the context of a processor-level scheme.

Option a1: An output-based approach

159. An output-based allocation approach is where the number of units allocated is based on the level of production as an average across the sector. The calculation is as follows:

$$\text{Allocation} = \text{total product} \times \text{emissions factor} \times \text{allocation rate (95\%)}$$

where the allocation emissions factor would represent the national average emissions per tonne of the relevant product (slaughtered animal, milk solids).⁵⁰

160. The output-based method is currently used in legislation for agricultural allocation. It is also the method used for industrial allocation for non-agricultural sectors in the NZ ETS.
161. One significant benefit of an output-based approach is that under output-based free allocation, processors could receive the full benefit of using unique emissions factors. This would mean that instead of calculating their emissions for their emissions obligation based on national average emissions factors (ie, emissions per kilogram of produce), processors could work with suppliers to undertake more specific emissions calculations that recognise their actions to reduce their emissions intensity (termed a **unique emissions factor** in the CCRA). Because the calculation of free allocation is not tied to the calculation of their emissions obligation as in the proportional approach, processors with a lower than average unique emissions factor may receive a greater proportion of free allocation as compared to their emissions obligation.
162. The specifics of such an approach would be a process for further work and development through regulations. Processors could choose whether to pass that reward through to farmers, either based on individual farms or averaged across farmers. There is some risk that a processor with relative monopsony power in a region may choose to hold on to the benefits of the unique emissions factor (rather than passing them down to their farm suppliers). These risks will be considered through the development of regulations.

Option a2: A proportional approach

163. A proportional allocation method is where a simple 95 per cent discount on each processor's estimated emissions is applied. This is based on their production – so the kilograms of milk/meat/fertiliser they process – in a given year. The calculation is as follows:

$$\text{Allocation} = \text{emissions (total product for year} \times \text{emissions factor)} \times \text{allocation rate (95\%)}$$

where the emissions factor would represent the national average emissions per tonne of the relevant product (slaughtered animal, milk solids).⁵¹

164. Because proportional allocation is directly related to their total emissions in a year, there is almost no incentive for a processor to seek to get recognition for mitigation actions

⁴⁹ For example, in the case of fossil fuel use by greenhouse growers, free allocations (industrial allocations in the NZ ETS) are provided to greenhouse growers, whereas the emissions obligation sits upstream with the coal, oil and gas companies who sell and distribute those fossil fuels.

⁵⁰ IPCC's technical appendix 5: Free Allocation, page 26

⁵¹ Ibid.

IN CONFIDENCE

through a unique emissions factor. This approach is therefore less likely to incentivise emissions reductions than the output-based approach.

Issue b: Emissions units can be allocated either before, or with, emissions payment obligations

165. There are choices about the timing for when free allocation units are provided to participants. For example, free allocation units could be given to processors either in advance of their obligations for each year's emissions (so they could trade them before they are required to account for their emissions obligations) or at the same time as those obligations are due.
166. Two options were identified. Allocation before emissions payments are provided was discarded due to concerns about large volumes of units entering and exiting the NZ ETS market during the interim pricing at processor-level stage.

Proposal b1: Provide and subtract free allocation from the amount due

167. In this option, processors calculate their free allocation at the same time as their emissions obligations are due. Any free allocation is subtracted from the total emissions obligations. This removes the need for bulk transference of units between the Crown and processor participants. Having large volumes of units entering and exiting the market during the interim pricing at processor-level stage could create volatility in the unit price.

Issue c: Whether to keep or change existing phase down rates

168. Any change to the level of free allocation should be informed by robust, objective analysis, including on potential economic and social impacts on rural communities. The Interim Committee recommended phase down should be well signalled and predictable, and that decisions on phase down could be informed by advice from the Commission.
169. The rate of 'phase down' (also called phase out) is the rate at which the level of free allocation is changed over time. The purpose of phasing down free allocation would be to ensure there is a sufficient price incentive in place. This in turn should be aligned with the emission budgets and targets set under the Zero Carbon Amendment Bill and New Zealand's Nationally Determined Contribution⁵².
170. The Act currently sets free allocation to agriculture to phase down by 1 per cent per annum after the first year of surrender obligations. However, the Act also provides for a temporary suspension on phase down, which may be lifted by a specific date by Order in Council.
171. Five options were considered and three discarded. The discarded options were:
 - c3. repealing the temporary suspension (1 per cent per annum would begin automatically). It is considered too soon to do this. The preference is to allow the policy to "bed in" before beginning phase down. This is consistent with industrial allocation provided to other sectors (which have had a number of years of fixed allocation rates since entry to the NZ ETS).

⁵² New Zealand's Nationally Determined Contribution is to reduce greenhouse gas emissions by 30 per cent below 2005 levels by 2030. More information is available here <https://www.mfe.govt.nz/climate-change/why-climate-change-matters/global-response/paris-agreement/new-zealand%E2%80%99s-nationally>

IN CONFIDENCE

c4. aligning with the phase down rate for industrial allocation.⁵³ Reasons for discarding are the same as c3, above.

c5. repealing the phase down rate. This removes the current flexibility the Government has to decide to initiate a phase down, without reopening the Act.

172. Officials consider that the phase down rate should be included in the list of key considerations for the 2022 report. This would enable the Government to amend the 1 per cent phase down rate if another rate or approach were considered more appropriate. This would also ensure the phase down rate was considered alongside other important farm-level policy settings, such as the level and method of free allocation.

Option c1: Retain the default 1 per cent phase down rate and temporary suspension currently in the Act.

173. Retaining the default phase down rate and temporary suspension currently in the Act allows flexibility for the 1 percent phase down to be initiated by Order in Council. It also allows for, if and when necessary, the price incentive to increase gradually over time. This option also provides opportunity for a robust analysis of the costs and impacts of phase down across the economy before any decisions are made.

174. The current legislative settings do not provide flexibility for the phase down rate to be changed from 1 percent once initiated (except by passing further primary legislation in future).

Option c2: Retain default 1 per cent phase down rate and temporary suspension currently in the Act but defer ability to remove temporary suspension until 2025.

175. This option provides additional short-term certainty for participants relative to option c1, by fixing allocation rates at 95% until 2025.

176. The current legislative settings do not provide flexibility for the phase down rate to be changed from 1 percent once initiated (except by passing further primary legislation in future).

Issue d: Process for decisions on phase down on free allocation

177. The Government has tabled a Bill this year establishing an independent Climate Change Commission to advise the Government on emissions budgets and NZ ETS settings towards meeting New Zealand's climate change targets.

178. The Government has also taken decisions this year to allow the Commission to advise on activity-specific phase down rates for free allocation to industrial activities.⁵⁴

179. Providing a role for the Commission to advise the Government on agricultural allocations is consistent with its wider role as an independent advisor on climate change policy. The Government intends to set this in legislation to provide certainty about the process that will be followed.

180. Officials considered a range of options for the exact role of the Commission regarding free allocations. Discarded options were:

- d3 The Commission determines the rate of phase down of allocations (no Ministerial discretion). This is inconsistent with the wider role of the

⁵³ 1% per annum from 2022-2030, 2% per annum from 2031-2040; and 3% per annum from 2041-2050.

⁵⁴ Expected to be introduced to the House through a Bill in September 2019.

IN CONFIDENCE

Commission for other ETS settings as an advisor, with decisions taken by the Crown.

- d4 The Commission advises on activity-specific phase down rates (aligned with industrial allocation). Further analysis on prudent and effective phase down rates for a farm-level pricing scheme can more effectively be considered through the 2022 report.
- d5 The Commission is explicitly forbidden from advising on agriculture free allocation rates. Free allocation for agriculture fits with the remit and purpose of the Commission. There is a strong rationale for ensuring the Government is provided with independent, robust and objective analysis in making decisions on free allocation rates in the context of New Zealand's targets.

Option d1: The Commission advises on the rate of free allocation in agriculture

181. This option would mean that the Commission's legislated remit for advising the Government includes the delivery of advice on free allocation rates in agriculture, in the context of its wider advice on emissions budgets, NZ ETS settings, and wider climate change policy settings towards meeting New Zealand's climate change targets.
182. While the Commission would be able to advise the Government on free allocation settings, the Government would be limited in the ways it could respond without passing further primary legislation (refer issue c above). The Government would only be able to respond to Commission advice by either:
- introducing a phase out of allocations by 1 percentage point per annum, or
 - place/retain a temporary suspension on phase out.
183. Other phase out settings (eg, a phase-out of 3% for fertiliser and 0.5% phase out for livestock) would not be possible through secondary regulations.

Option d2: The Commission is not required to provide advice on the rate of free allocation in agriculture

184. This option would mean that the Commission is not required to advise the Government on free allocation rates in agriculture. However, despite this, the Government would still be able to request a specific standalone report advising on free allocations from the Commission.

Issue e: Allocation factors need regular adjustment

185. Emissions per unit of agricultural production in New Zealand have decreased at a rate of about 1 per cent per year over the last 25 years (emissions per kilogram of meat or milk solids produced) and further improvements are expected in the near future.⁵⁵
186. These reductions in emissions per unit of product have been achieved through New Zealand's farms becoming more efficient. For many farmers, this has been achieved through improved animal genetics and management, combined with better grassland managed and feeding practices mean that farms are using resource more efficiently to increase their outputs.

⁵⁵ Emissions per unit of product is often referred to as emissions intensity or emissions efficiency in climate change literature.

IN CONFIDENCE

187. For the interim option of a processor-level scheme, officials are proposing to update default emissions factors used to calculate a participant's obligations regularly to recognise and reflect these improvements in emissions per unit of agricultural production achieved by New Zealand farmers. This would mean that as New Zealand farm suppliers improve their emissions efficiency over time, processor participants in the ETS would face a lower total obligation as a result.
188. However by updating default emissions factors on a regular basis, there is a risk of over-allocation. For example, if allocative baselines (the emissions factors used to calculate allocations) are not updated, the amount of allocation provided to agriculture would be equivalent to 100 per cent of actual agriculture emissions in around five years' time on current trends (assuming allocations remain at 95 per cent free allocation). Over-allocation would result in the pricing scheme not effectively incentivising the agricultural sector to reduce its emissions (failing against the primary effectiveness criterion).
189. Reviewing and updating allocative baselines to take account of business-as-usual improvements can prevent these risks of over-allocation. Officials considered four options for achieving this:
 - e1. Update emissions factors regularly; and update allocative baselines regularly through secondary regulations
 - e2. Update emissions factors regularly; and set allocative baselines to update automatically through primary legislation
 - e3. Update emissions factors regularly; and do not update allocative baselines regularly
 - e4. Fix emissions and allocation factors through primary legislation.

The option of fixing emissions and allocation factors through primary legislation based on current levels [option e4] was discarded as it is in New Zealand's and the sector's interests that regulations keep pace with their improvements. Not doing so is likely to mean that agricultural participants are overcharged relative to their actual emissions in a given year (given improving baseline emissions efficiency).

IN CONFIDENCE

Assessment of Processor pricing in the NZ ETS free allocation design details for agriculture

190. If the Government decides to implement processor level pricing between 2021 and 2025, various detailed design decisions will need to be made. To do the multicriteria analysis for this section we have decided to assess against the following smaller subset of criteria, used before.

- Increases agricultural sector emissions reductions
- Enduring policy and investment predictability
- Cost-effective for the agricultural sector and the New Zealand economy.

191. We have determined that other criteria used in the earlier analysis were not relevant for this assessment.

DECISION a – Method for calculating free allocation

Assessment criteria	Option a1 - Output based approach	Option a2- Proportional approach
Increases the incentive for agricultural emissions reduction	<p>++ Increases the financial/behavioural incentive for the agricultural sector to reduce emissions compared with the status quo. The incentive could be marginally stronger than a proportional based approach as it allows processors to apply for unique emissions factors (UEFs) to demonstrate their individual emissions intensity is lower than the national sector average.</p> <p>Processors could choose whether to pass this reward through to farmers, either based on individual farms or averaged across farms. However, this option would disadvantage larger processors whose emissions intensity more closely reflected the national average.</p>	<p>+ Increases the financial/behavioural incentive for the agricultural sector to reduce emissions compared with the status quo.</p> <p>However as this approach is directly related to total emissions in a year, there is no incentive for a processor to seek recognition for mitigation through a UEF. Therefore, it is slightly less likely to incentivise emissions reductions compared with an output based approach.</p>
Enduring policy and investment predictability	+ Would create more policy and investment certainty compared with the status quo.	+ Would create more policy and investment certainty compared with the status quo.
Cost-effective for the agricultural sector and the New Zealand economy	+ Would have relatively low administration costs for Government and be simple to implement.	+ Would have relatively low administration costs for Government and be simple to implement

IN CONFIDENCE

DECISION b – Timing of providing free allocation

192. There are choices about the timing for when free allocation units are provided to participants. For example, free allocation units could be given to processors either in advance of their obligations for each year's emissions (so they could trade them before they are required to account for their emissions obligations) or at the same time as those obligations are due.
193. Options for providing free allocation units before emissions payments are provided (including to mirror the same approach as legislated for industrial sectors) was discarded due to concerns about large volumes of units entering and exiting the NZ ETS market during the interim pricing at processor-level stage.
194. Officials preferred option is for processors to calculate their free allocation at the same time as their emissions obligations are due – also known as 'netting off'. Any free allocation would be subtracted from the total emissions obligations.

Assessment criteria	Preferred option – Provide and subtract free allocation at the same time as units are surrendered
Increases the incentive for agricultural emissions reduction	+ Increases the financial/behavioural incentive for the agricultural sector to reduce emissions compared with the status quo. May not offer the greater marginal incentive provided by a two-stage allocation and surrender process.
Enduring policy and investment predictability	+ Provides greater policy certainty for ETS volumes and unit supply settings. It could also offer durability and investment predictability by reflecting the netting off approach likely to be implemented at farm level, as recommended by the Interim Committee and requested by agricultural sector submitters.
Cost-effective for the agricultural sector and the New Zealand economy	+ This option would be simpler for regulators than the discarded option above as it reduces the need for bulk transfer of units between the Crown and processors, and reduces risks of unit price volatility. Also reduces administrative and transaction costs for sector participants.

IN CONFIDENCE

Decision c - Whether to keep or change the existing phase down rates

Assessment criteria	c1 Retain the default 1 per cent phase down rate and temporary suspension currently in the Act.	c2. Retain default 1 per cent phase down rate and temporary suspension currently in the Act but defer ability to remove temporary suspension until 2025
Increases the incentive for agricultural emissions reduction	+ Enables flexibility to increase the price incentive gradually over time by regulation. Also allows the opportunity for a robust analysis of the costs and impacts of phase down across the economy before any final decisions are made.	+ Enables flexibility to increase the price incentive gradually over time by regulation. Also allows the opportunity for a robust analysis of the costs and impacts of phase down across the economy before any final decisions are made.
Enduring policy and investment predictability	- Risk of interim and long-term uncertainty if regulations triggered by Order in Council	+ Interim investment certainty around allocation phase down rate, while allowing Parliamentary scrutiny (2022 ministerial report and any subsequent primary legislation) prior to any phase-out
Cost-effective for the agricultural sector and the New Zealand economy	<p>0 Allow a gradual price increase allows for costs and impacts to be managed gradually.</p> <p>Phase-down rate of 1 percentage point per annum phase down may not be optimal relative to targets and risk of impacts to rural communities or emissions leakage.</p>	<p>0 Allow a gradual price increase which allows for costs and impacts to be managed gradually.</p> <p>Phase-down rate of 1 percentage point per annum phase down may not be optimal relative to targets and risk of impacts to rural communities or emissions leakage.</p> <p>Delays any phase down for five-years which may make meeting New Zealand's 2030 targets more difficult/costly to achieve across economy than option c1.</p>

IN CONFIDENCE

Officials’ preferred option is to legislate now for no phase down until 2025 [option c2], after which phase down can be started through Order-in-Council. This provides additional short-term certainty for participants prior to move to farm-level pricing scheme.

While this may marginally increase the difficulty of meeting New Zealand’s 2030 targets (relative to option c1), this is considered justified given the significant challenges still needing to be worked through for design of the farm-level pricing scheme prior to 2025.

The phase down rate should be included in the list of key considerations for the 2022 report on the feasibility of a future farm-level pricing scheme. This would enable the Government to amend the one per cent phase down rate if another rate or approach was considered more appropriate. This would also ensure the phase down rate was considered alongside other important farm-level policy settings, such as the level and method of free allocation.

DECISION d – Process for decisions on phase down of free allocation

Assessment criteria	d1 Commission advises on rate of free allocation in agriculture	d2 Commission is not required to provide advice on rate of free allocation in agriculture
Increases the incentive for agricultural emissions reduction	0 Provides process by which Government can receive independent analysis on whether to phase down free allocation.	0 About the same as status quo.
Enduring policy and investment predictability	+ Clear process for Government receiving independent advice on free allocation settings.	- No clear process for Government receiving advice on phase down of free allocation.
Cost-effective for the agricultural sector and the New Zealand economy	+ Process for Government to receive independent advice on free allocations (in the context of wider climate change policy settings) towards meeting New Zealand’s targets.	0 About the same as status quo.
Officials prefer option d1 , as it provides a clear process for which the Government receives independent advice on free allocation rates in agriculture to factor into its policy decisions.		

DECISION e: A process for updating allocative baselines

195. Reviewing and updating allocative baselines to take account of business-as-usual improvements can prevent these risks of over-allocation. Officials considered four options for achieving this:
- e1. Update emissions factors regularly; and update allocative baselines regularly through secondary regulations
 - e2. Update emissions factors regularly; and set allocative baselines to update automatically through primary legislation
 - e3. Update emissions factors regularly; and do not update allocative baselines regularly
 - e4. Fix emissions and allocation factors through primary legislation.
196. Officials explored the option of legislating an automated process to undertake the updating of allocative baselines consistent with the Independent Committee on Climate Change's report [Option e2 above], but have identified issues with this approach. In particular, by legislating an automatic updating of allocative baseline, this would increase the risk that genuine additional efforts by processors to reduce emissions of their farm-suppliers do not get fully credited at the margin.
197. To illustrate this, if a large sheep meat processor – who made up 50 per cent of New Zealand's production – worked with their farmers to reduce their emissions intensity by 3% per annum but held production constant, this would see their emissions liability drop by 3%. However, because that processor made up a large proportion of New Zealand's total production – the automatic updating of allocative baselines would mean the number of units allocated to them would also drop by 1.5%, eroding the marginal benefit of them pursuing these emissions reductions together with their farm suppliers.
198. For a farm-level scheme, this risk would not be as significant, as any given farmer participant will be small relative to the national level. However, mechanisms to update allocative baselines are linked to a range of considerations in the 2022 Ministerial report (on design of the pricing scheme, allocation rate and phase down, and treatment and weighting of different greenhouse gases), and can be most appropriately determined in this context. For example, the objectives and risks around allocative baselines may differ in an ETS (cap and trade scheme), relative to a baseline and credit pricing scheme, or a levy/rebate pricing scheme.
199. **For an interim processor level scheme, officials consider these issues can best be addressed through secondary regulations [Option e1]**, with the initial process to set secondary regulations expected to occur in 2020, and allowing stakeholders to consider the proposals for updated emissions factors alongside proposals for allocative baselines.

IN CONFIDENCE

Assessment criteria	Option e1– Update emissions factors regularly; and update allocative baselines regularly through secondary regulations	Option e2 – Update emissions factors regularly; and set allocative baselines to update automatically through primary legislation	Option e3– Update emissions factors regularly; and do not update allocative baselines regularly
Increases the incentive for agricultural emissions reduction	+ Maintains effective marginal incentive to reduce emissions	0 Risks seeing reduced marginal incentive to reduce emissions for processor-level scheme.	- Expected to result in over-allocation after ~5 years.
Enduring policy and investment predictability	0 Updating of allocations would be subject to regular consultation with affected stakeholders prior to update	+ Future allocations can be more easily predicted due to these settings being incorporated in primary legislation	+ Clear signal of allocative baselines trajectory for affected stakeholders
Cost-effective for the agricultural sector and the New Zealand economy	+ Reflects ongoing sector improvements in emissions intensity and productivity and avoids potential over-allocation.	0 Partially reflects ongoing sector improvements in emissions intensity and productivity; and avoids potential over-allocation.	- Expected to result in over-allocation after ~5 years.
<p>Due to time constraints and unresolved issues around updating of allocative baselines for a processor-level scheme in primary legislation [option e2], officials prefer option e1 as it allows for updating of allocative baselines to avoid over-allocation, while preserving the ability for participants to be credited with full marginal benefit of achieved emissions reductions.</p> <p>To bolster participant’s certainty for when and how allocative baselines will be updated on an ongoing basis, officials propose enhancing option e1 by further legislating this year that the Minister is required to update allocative baselines through secondary regulations no less than three years after they are last updated. This will ensure that affected stakeholders are regularly consulted in the updating of allocative baselines, and that a structured process is established whereby these issues must be considered.</p> <p>After details of the future farm-level pricing scheme are determined through the 2022 report, option e2 may be preferable on a long-term basis to provide increased policy and investment predictability. However, doing so would require further legislative changes in future (after 2022).</p>			

3.2 What criteria, in addition to monetary costs and benefits, have been used to assess the likely impacts of the options under consideration?

Comment on relationships between the criteria, for example where meeting one criterion can only be achieved at the expense of another (trade-offs)

The criteria are set out and discussed in **Table 1: Assessment objectives and criteria for the options in this RIA** in template box 2.3 above

3.3 What other options have been ruled out of scope, or not considered, and why?

List the options and briefly explain why they were ruled out of scope or not given further consideration.

The ICCC report (see Technical Appendix 3: Analysis of Regulatory options against criteria) identified two options that were not considered: Negotiated targets and Project Crediting. These were not given further consideration by officials as the ICCC had already considered them to be unfeasible or unworkable.

Section 5: Conclusions

5.1 What option, or combination of options, is likely best to address the problem, meet the policy objectives and deliver the highest net benefits?

200. A farm-level livestock emissions pricing scheme is officials' preferred approach in the long-term, and feedback from consultation has confirmed wide public support for this. The large majority of submitters supported taking action to reduce agricultural emissions. In general, farm-level pricing of livestock emissions was supported across all stakeholder groups as compared to processor-level pricing. The major agricultural organisations supported a pricing mechanism as part of a broader policy package to incentivise agricultural emissions reductions – but only if farmers are able to account for all on-farm removals as well as sources. A farm-level emissions pricing scheme is likely to be the most effective means of delivering on the Government's objective of a just, inclusive transition to a low-emissions economy, and achieving the 2030 and Zero Carbon Bill targets.
201. Implementing a farm level emission pricing scheme by 2025 will be challenging. In achieving this, New Zealand would likely become the first country in the world to introduce a nationwide system for farm level measurement, reporting and pricing of emissions. Significant work is needed in partnership with the sector to determine the detailed design of a farm-level system, and clarify that it would be technically feasible and administratively cost-effective. This will be considered as part of a Ministerial report to Parliament in 2022 on the detailed design of the farm-level scheme. In addition, Government, the agriculture sector and iwi/Māori need to work in partnership to build the capability of farmers and growers to be able to respond to a farm level emissions pricing scheme.
202. Officials consider that either a processor-level ETS or a modified formal sector-government agreement could potentially serve as a viable interim option towards a farm-level emissions pricing scheme from 2025.
203. However, as they currently stand, officials consider the processor-level ETS option (Option E) has technically greater merit. Option E has the advantage that it introduces a policy lever now to price and therefore manage emissions overtime, impacting investment decisions, and contributing towards meeting New Zealand's targets from the start of the 2020s.
204. Option E also provides greater funding from the sector to deliver the necessary elements of a workable and effective farm level pricing scheme (\$40-\$50 million from a processor-level ETS annually relative to \$25 million annually plus any negotiated additional funds from the Leaders Group proposal).
205. However, Option E could present a risk to future buy in from agriculture stakeholders to the ultimate long term objective of farm level pricing by 2025. The majority of agriculture sector stakeholders consider a farm level policy package, including an emissions price, as optimal and have signalled a strong preference to work directly reward that goal. Their key concerns with pricing emissions at the processor level in the interim are inefficiencies associated with recycling funds, potential policy lock in of processor pricing, and loss of goodwill across the sector that could slow progress to a farm level policy in 2025.
206. Option F of a formal-sector government agreement has the advantage that it achieves greater buy-in from those that will be most directly affected by agriculture climate change policy – land owners, growers and farmers. However, sector leaders have not yet committed to unconditional support of emissions pricing from 2025; and their proposal

IN CONFIDENCE

does not provide a guarantee of emissions reductions in the short-term or provide as much near-term investment certainty.⁵⁶

207. Officials consider that subject to some strengthening Option F, formal sector government agreement could be a viable interim option. If pursuing Option F officials recommend commitments are sought from sector leaders to:
- (1) accept or support pricing agricultural emissions from 2025, whether or not it is feasible at the farm level.
 - (2) co-governance of the programme of action with representation from iwi/Māori, government and the agriculture sector (including co governance of funds)
 - (3) set out and cost the 5 year programme of action together with the co-governance group by an agreed date and detail where additional sources of funding will come from if shortfall is identified. The programme of action should reflect milestones of voluntary emission reporting by 2023 and mandatory emission reporting by 2024 and detail specific funding for programmes to support Māori landowners.
208. If pursuing Option F, officials recommend creating the ability for government to bring in a processor-level scheme by Order in Council at any time prior to 2025. This could be subject to regular review of progress assessing whether commitments and key milestones are being met.
209. The government needs to ensure that iwi/Māori participate in any negotiation with Primary Sector Leaders over a formal government sector agreement. Embedding a Crown/Māori partnership approach in the agreement and the resulting work programme will be critical to ensure inclusive policy development; reflect iwi/Māori aspirations for their land, assets and enterprise; and avoid potential disproportionate impacts.

5.2 Summary of costs and benefits of the preferred approach

210. The Cost Benefit Analysis of the options drew on Manaaki Whenua - Landcare Research (MWLR) analysis using the NZFARM model. This modelling assessed the likely sectoral and sub-sectoral changes in net revenue, greenhouse gas emissions and land use associated with the emissions price and policy options.
211. See Appendix B for a brief summary of the MWLR report of its modelling of agricultural climate change mitigation policy scenarios.
212. This model produced estimates of the aggregate cost to the sector of responding to the options under the different scenarios. The aggregate cost is a mix of the resource cost of land use changes or changes in farming practice and the emissions price paid to the government. (In some circumstances the aggregate cost was in fact calculated as a benefit, where farmers were incentivised to shift to more profitable land uses or practices.)
213. Using the MWLR report, the following cost benefit analysis was run of the interim option where prices and costs are fairly certain.

⁵⁶ Both options provide marginally increased investment certainty for farmers, growers and land-owners pursuing lower emissions activities than the status quo – in particular through a) early-adopters/pilot type programmes; b) roll-out of complementary measures such as a climate change module in a farm environment plan; c) work to support farmers to understand their emissions number and d) legislating farm-level pricing from 2025 this year. However, a processor-level price would also ensure processors would see a direct emissions price within their business.

CBA 2020 - 2025 Processor level ETS

Costs (\$mFV)	Party	Impact	NPV 2020-2024
2020-2025 Processor level ETS			
	Farmers	Directly from MWLR, includes both ETS payments and on-farm mitigation costs	\$149.81
	Processors	Assume all costs are passed to farmers	\$0.00
	Processors	Adminstration costs - one off	\$0.14
	Processors	Adminstration costs - per year	\$0.32
	Processors	Transaction costs (if ETS)	\$0.79
	Regulator	Capital costs dev system	\$0.89
	Regulator	Operational costs system	\$2.81
Total costs (\$m PV)	Party	Impact	
	Farmers		149.8
	Processors		0.5
	Regulator		3.7
	Total		154.0

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Benefits

= calculated as costs saved by not sending \$ overseas (for overseas units) and instead the \$ stays and circulates in NZ

	Annual methane and nitrous oxide emissions savings tonnes CO ₂ e	From MWLR processor level scenario	
	Equilibrium level of total additional afforestation (ha)	From MWLR processor level scenario	
	Annual additional afforestation (ha)	Assume that a third of the difference between additional afforestation to date and the equilibrium level of additional afforestation is actually afforested in a given year	
	Additional carbon sequestration 2020-2030, from additional afforestation between 2020 and 2024	Derived from additional afforestation above.	730,000
	Methane and nitrous oxide emissions savings against Paris Target		615,240
Benefits (\$mFV)	Party	Impact	
	NZ economy	Value of reduced international purchases at 2030 discounted back Using production change in MWLR report with processor Efs, note this is less than GHG emissions times the carbon price.	24.8
	NZ Government - ETS revenues		146.0
Total benefits (\$m PV)	Wider Government		170.8

B/C ratio

1.11

214. The above B/C ratio is highly dependent on the carbon price path. More sensitivity/scenario analysis would be possible, including variations of allocation phase out rates and emission factors. This central estimate is based on a price path from \$25/t in 2020 to \$66/t in 2050.
215. The ratio is marginally positive because the estimated value of the emissions reductions just outweighs the set up and transaction costs. It is important to note that this cost benefit analysis only applies to the interim measure of bringing biological agriculture emissions into the ETS at processor level over the period 2012-25 interim measure. This is only being implemented with the intention of getting the sector ready for the long-term policy with much greater potential to change farm practice leading to much larger emission reduction benefits over time.
216. For the longer term options (eg. farm level processing pot 2025, there are too many uncertainties associated with scheme design and allocation rates etc. to allow for a meaningful cost benefit analysis to be undertaken now. This analysis will necessarily be a key component of the 2022 report, as impacts are potentially much greater and the distribution of costs and benefits is uncertain.

5.3 What other impacts is this approach likely to have?

217. The ICCC commissioned research on how changes in land use as a result of pricing agricultural emissions (either at the processor or farm level) could impact rural communities and employment. This research found that:

- a price on emissions at current prices, with 95% free allocation, seemed unlikely to have significant impacts on land-use change or on rural communities.
- the main driver of change, especially change from sheep/beef or scrub land into forestry, was the reward for carbon removals from forests, not the price on agricultural emissions.
- impacts on direct employment from land-use change could be small at the national level but could have more significant implications in some areas.
- in regions where relatively low-value sheep and beef land is converted to forestry, impacts on employment may not be large. But areas with lower-than-average employment rates could be more affected.
- some land-use change from dairy to horticulture could occur. This would generate more jobs, although some of those jobs would be seasonal.

218. The **actual** impacts of pricing emissions at the farm level from 2025 will depend on the final design of the scheme, which is yet to be developed. Fully assessing these impacts will not be possible until more detailed analysis of different design options has been done. This analysis will be undertaken as part of a report to Parliament on the details of the farm level scheme.

5.4 Is the preferred option compatible with the Government's 'Expectations for the design of regulatory systems'?

The NZ ETS has already established that pricing greenhouse gas emissions is consistent with the Government's 'Expectations for the design of regulatory systems'.

Section 6: Implementation and operation

6.1 How will the new arrangements work in practice?

Legislation, regulations and other processes

1. Current legislation affecting the participation of agricultural participants in the ETS that will be reviewed and updated based on the policy proposals of this RIA include, but are not limited to:
 - **Climate Change Response Act 2002 (the CCRA)**: Establishes the ETS, the types of agricultural activities in the ETS, and who mandatory participants are.
 - **Climate Change (Agriculture Sector) Regulations 2010**: Establishes methods, information and emissions factors used to guide how agricultural activities are treated in the ETS.
 - **Climate Change (General Exemptions) Order 2009**: Sets exemptions for entire activities or parts of activities that are not required to participate in the ETS.
 - **Climate Change (Unit Register) Regulations 2008**: Establishes how participants interact with the unit register of the ETS.
2. Cabinet intends to introduce an amendment bill during 2019 amending the CCRA to give effect to policy decisions in this RIA. MfE and MPI will work with the Parliamentary Counsel Office on drafting of the Bill.
3. These legislative changes will need to be supported by regulations on the operational details of agriculture in the ETS (for both livestock and fertiliser activities). The process setting regulations will be led by MfE and MPI and undertaken prior to surrender obligations entering into effect for agricultural activities. In the case of a processor-level obligation, this would be expected to occur in 2020, and for a farm-level obligation during 2022-2024. The process setting regulations will include consultation with relevant affected stakeholders.
4. New regulations will need to be made on matters such as allocations. In addition, some other regulations that do not currently include agricultural activities within their scope (eg, those determining unique emissions factors, and removal activities) may also need updating by MfE and MPI as part of implementing a processor-level ETS and/or 2025 farm-level emissions pricing. The scope of any such changes will be subject to further Government decisions, and are excluded from the scope of this RIA.
5. Other linked measures (such as the establishment of a fund or body to recycle revenue raised by a processor-level obligation) will also require further decisions by the Government and budget appropriations to give effect to them. These are excluded from the scope of analysis in this RIA, but are likely to have additional operational and resourcing requirements.

2022 report and 2025 farm-level emissions pricing scheme

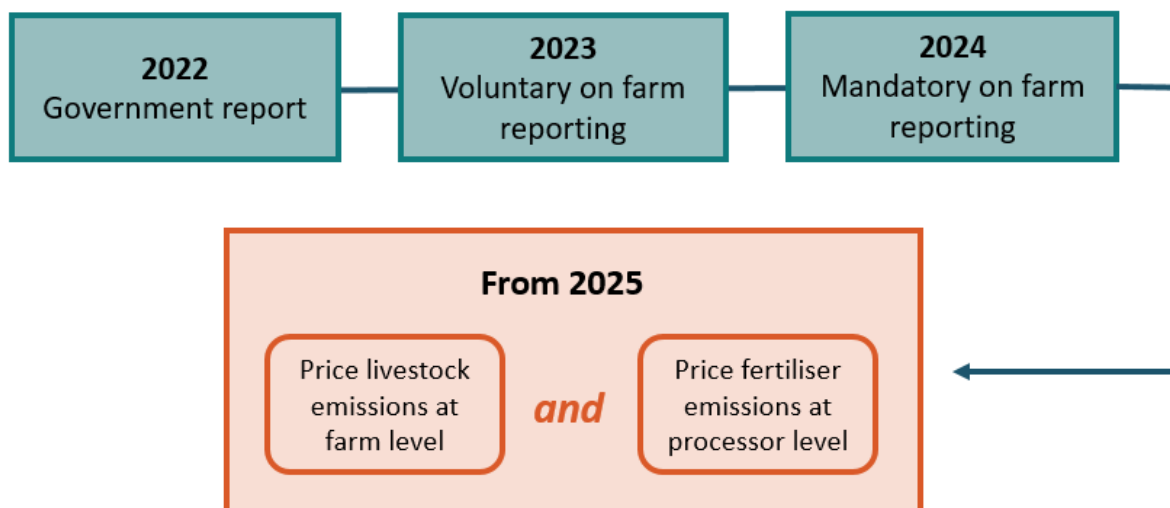
6. The proposed 2022 report back to Parliament by Ministers will set out further legislative and/or regulatory changes to give effect to the future 2025 pricing scheme (eg, establishing how farm-level allocations will be calculated, setting thresholds for activities).
7. Changes set out in the 2022 report will have an impact on the implementation and operational details for this future scheme. As a result, estimates of the details of the 2025 emissions pricing scheme presented in this RIA are initial high-level estimates by

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officials, which are likely to change based on future policy decisions and recommendations set out in the 2022 review.

- An illustrative timeline of the pathway towards a 2025 farm-level emissions pricing scheme is shown below.

Figure 1: Timeline of steps for implementing a farm-level emissions pricing scheme



Administration, compliance, operations and IT

Processor-level ETS

- The EPA is currently administrator of the ETS, including for existing reporting obligations for agricultural participants. The EPA will retain responsibility for the implementation, and ongoing operation and enforcement of processor-level surrender obligations from 2021.
- Withheld under s9(2)(f)(iv)**
- There are a range of operational activities that will be required to introduce surrender obligations for agricultural processors in the ETS. The exact mix of activities to ensure both participants and the regulator are ready to implement the changes depend on subsequent policy decisions (setting secondary regulations).

List of likely implementation/operational activities for processor-level ETS:

- IT system development;
- Education for processor participants in the ETS;
- Update of ETS guides, websites and material;
- Staff training;
- Application processing centre/call centre training;
- Recruitment of additional operations staff/, processing centre staff and compliance staff.
- Legal advice to clarify interpretation of the new legislation and regulations to inform operational processes and decision-making.

Page redacted under s9(2)(f)(iv)

Withheld under
s9(2)(f)(iv)

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

Work programme towards a farm-level emissions pricing scheme

12. The development of a farm-level emissions pricing scheme will incur a range of costs for the Government attached to work programmes around policy design, development of estimation tools, encouraging the use of climate modules within farm environment plans, and developing on-farm advisor systems and capability.
13. The Government is proposing that these work programmes are developed together with sector stakeholders, iwi/Māori and other parties. Because these work programmes will be developed with input from stakeholders outside government, the scope and cost of these has not yet been determined and is excluded from this RIA. MfE and MPI expect this work to take place over a range of years (from 2020-2024/5).
14. The Government's 2019 Productive and Sustainable Land Use budget package includes a commitment of \$122 million towards on-the-ground advice to farmers; supporting Māori agribusiness; information, tools and advice to support farmers making change to more environmentally sustainable and higher value production; improving on-farm emissions data and upgrading decision and regulatory tools; and protecting high-value food exports and updating our official assurances system. These measures are expected to contribute towards the delivery and effective functioning of the farm-level emissions pricing scheme in 2025.

2025 farm-level emissions pricing scheme

15. The Government has not made any decision on which agency will administer the farm-level emissions pricing scheme from 2025, and these details will be considered as part of the 2022 report back to Parliament. Implementation cost estimates of this future farm-level scheme assume that either the EPA or MPI (who currently administer a number of ETS forestry functions) hold administrative duties for farm-level agricultural participants as these entities are likely to be most appropriately resourced for this task.
16. Officials' current estimates for the annual administration costs of a farm-level pricing scheme range anywhere from \$20 million to \$120 million per annum across agencies, dependent on the design of the scheme (ie, more complex farm-level allocation methods involved higher administration and compliance costs). There would also be additional set-up costs in the order of \$7 to \$15 million.
17. Some of the key areas of policy-design for a future farm-level scheme which will impact implementation and administration costs include:
 - **Methodologies for farmers, growers and landowners calculating emissions:** More complex models will capture more on-farm mitigation activities and give more accurate estimates of emissions. However, added complexity can result in

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higher compliance costs for both participants and/or administrators of the scheme, and higher rates of non-compliance (due to more mistakes being made).

- **Allocation methodology and recipient:** The ICCC examined a range of different farm-level allocation methods (including proportional allocations, output-based, land-based, and grand-parenting). More complex allocation methodologies (eg, those combining both output-data and land/spatial data) would be expected to involve higher implementation costs for establishing systems around allocations. Who allocations are handed to can also act as a driver of system cost. For example, if allocations are provided to the land owner, but reporting and pricing obligations are the responsibility of the stock owner – this would increase the number of entities involved in the scheme and administration costs.
- **Involvement of farm advisors or auditors:** Requirements placed on participants within the pricing scheme may affect the distribution and level of implementation costs. For example, requiring audited climate modules within Farm Environment Plans may lead to higher implementation costs.
- **Regularity of reporting and treatment of stock movements:** Requiring more frequent reporting of data by participants (eg, monthly or quarterly) may increase participant compliance costs and operational costs.
- **Definition of minimum thresholds for participation:** These definitions will impact the number of participants.
- **Degree of non-compliance and compliance approach:** The level of non-compliance is a key driver of operational costs. Operational decisions around the audit and compliance methods can act as a significant determinant of implementation costs. For example, desktop-based audits will have significantly lower cost versus on-farm site visits. The ability for the administration agency to quickly address non-compliance, potentially through simplified emissions return assessment methodologies will be key in terms of minimising these costs.

18. Details of these technical and operational decisions are likely to be set out through the 2022 review and subsequent work establishing regulations for the farm-level emissions pricing scheme.

Sources:

MfE/MPI/EPA

ICCC report https://www.iccc.mfe.govt.nz/assets/PDF_Library/f15921453c/FINAL-ICCC-Agriculture-Report.pdf

BECA report <https://www.mpi.govt.nz/dmsdocument/32146-nz1-15358430-assessment-of-the-administration-costs-and-barriers-of-scenarios-to-mitigate-biological-emissions-from-agriculture-final>

6.2 What are the implementation risks?

19. The timeframe to implement the interim proposals, progress legislation and secondary regulations is tight. Timing is still tight for the 2025 farm-level pricing scheme due to the scale and complexity of introducing a scheme that would apply to tens of thousands of farmers, growers and land-owners.⁵⁷
20. There are a number of other large implementation risks. These include:
 - No agency has been identified as the responsible agency to implement a farm-level scheme. Possible agencies include EPA, MPI, IRD⁵⁸, or a hybrid MPI/IRD model.
 - A significant number of amendments to the Act will be required to implement an effective and optimal farm level pricing policy. There is insufficient time to complete the required analysis to include these changes in the current amendment bill that is being drafted. As such the Act will likely need to be reopened in the future, and ideally prior to the introduction of mandatory farm-level reporting in 2024.
 - Constraints on the ability to pass further legislation may delay the development of an IT system to support the implementation of the policy, as the business requirements to establish procurement specifications cannot be completed until policy, primary legislation and regulations are clearly defined.
 - The EPA's current ETS system is online only. This may need to be re-examined if including 20,000-30,000 farm level participants within the EPA's ETS systems.
 - For the processor level obligation in the ETS from 2021, funding would be required for system build in advance of the next financial year. Delivery of these IT projects in a short timeframe will increase risks of not achieving effective delivery and implementation of these new systems.

⁵⁷ Estimates of the number of participants vary. The ICCC estimated around 20,000-30,000 businesses for a farm-level pricing scheme. However different definitions of who the participant is will impact on the number of participants. For example, lowering the threshold of minimum stock numbers or land-size may increase the number of businesses captured within the ETS.

⁵⁸ IRD have yet to be approached regarding any potential involvement in this area.

Section 7: Monitoring, evaluation and review

7.1 How will the impact of the new arrangements be monitored?

21. The Ministry for the Environment (MfE) is responsible for the overall administration of the CCRA, which includes providing policy advice to Ministers on the operation of the ETS. MfE previously led an evaluation of the ETS in 2016.⁵⁹
22. The 2016 evaluation developed a methodological framework for ETS monitoring. It used an investment logic mapping exercise to frame the evaluation by identifying the long-, medium- and short-term outcomes of the ETS. MfE may complete future evaluations using this framework – encompassing the participation of agricultural participants within the ETS. This is likely to be the main way that the new policy will be monitored.
23. The EPA will also monitor compliance levels, with success measured by monitoring trends in non-compliance rates over time.
24. The EPA utilises an ETS participant risk model, which takes in to consideration a number of different quantitative factors in determining the relative risk of non-compliance for a particular participant and sector. This is reviewed annually and forms part of the analysis used to determine each year's compliance programme. Agricultural participants are already included in this risk framework (as they currently required to report their emissions in the ETS).
25. The annual compliance programme includes desktop reviews, third party reviews and EPA inspections. The main focus is to review participant processes and calculations, and overall compliance with the legislation and regulations.
26. In addition to the annual compliance programme, the New Zealand Emissions Trading Register system alerts for high variance (greater than 20%) between current and previous returns or applications. These are followed up by EPA staff. The NZETR also provides alerts for defaulted returns (i.e. those not submitted on time), and failure to surrender units. These are also followed up by EPA staff, including enforcement action as appropriate.

7.2 When and how will the new arrangements be reviewed?

27. It is proposed that the Government will be required to present a report to Parliament in 2022 outlining the move to a farm-level emissions pricing scheme, and establishing details for how it will be implemented. This report is expected to cover issues such as:
 - The pricing mechanism, whether NZ ETS or Levy/rebate scheme
 - Definitions of the participants and activities;
 - Methodologies for calculating emissions;
 - Methodologies and eligibility for free allocation;
 - Rate, process and methodology for changes to the annual level of free allocation;
 - Mechanisms for calibration of methane relative to other greenhouse gases;
 - Set out whether and how carbon removals from on-farm forestry, vegetation and plantings will be recognised.

⁵⁹ www.mfe.govt.nz/sites/default/files/media/Climate%20Change/ets-evaluation-report.pdf

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28. The report tabled in 2022 will provide further opportunity for public review of the future farm-level scheme, and would be expected to then lead to additional primary and secondary legislation giving effect to the scheme.
29. Affected stakeholders will also have the opportunity to comment on processor-level emissions pricing through technical consultation on regulations guiding their participation in the ETS. This consultation process is expected to occur in 2020.
30. Participation of agricultural processors in the ETS will also be incorporated into wider evaluations and reviews relating to general ETS settings.⁶⁰

⁶⁰ Ministry for the Environment. (2016). *The New Zealand Emissions Trading Scheme evaluation report 2016*. www.mfe.govt.nz/sites/default/files/media/Climate%20Change/ets-evaluation-report.pdf

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Figure 2: Expected timeline for implementation of processor-level ETS (short-term) and farm-level pricing scheme (from 2025)

Activity	Year						
	2019	2020	2021	2022	2023	2024	2025
Milestones			Processor-level surrenders in ETS begin (livestock and fertiliser)	Ministerial report to Parliament with proposals for farm-level pricing	Farm-level voluntary reporting starts (or earlier)	Farm-level mandatory reporting starts	Farm-level mandatory pricing starts Processor-level pricing ends
Primary legislation	Amendment Bill to the CCRA for processor-level ETS and enabling future farm-level scheme				Second Amendment Bill for farm-level pricing as needed		
Regulations		Update of processor-level regulations including consultation			Officials develop farm-level regulations		
Policy development		Policy development of farm-level pricing scheme with stakeholders					
IT & operational		Develop new systems for processor-level ETS		Develop new systems for farm-level pricing			

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Figure 3: Expected timeline for implementation of formal sector-government agreement (short-term) and farm-level pricing scheme (from 2025)

Activity	Year						
	2019	2020	2021	2022	2023	2024	2025
Milestones				Ministerial report to Parliament with proposals for farm-level pricing	Farm-level voluntary reporting starts (or earlier)	Farm-level mandatory reporting starts	Farm-level mandatory pricing starts
Primary legislation	Amendment Bill to the CCRA enabling future farm-level scheme				Second Amendment Bill for farm-level pricing as needed		
Regulations					Officials develop farm-level regulations		
Policy development		Policy development of farm-level pricing scheme with stakeholders (through sector-government agreement)					
IT & operational				Develop new systems for farm-level pricing			

Appendix A: Further information on discarded regulatory and non-regulatory options

1. Officials agreed with the ICCC's assessment that regulatory options should be discarded. The brief analysis below captures the summary of officials analysis on these matters. Some of these, but not all, were addressed in the ICCC's report.

Option C (Discarded): Mandatory farm environment plans with good management practices

2. The ICCC describes this approach as follows: "every farmer would be required to have a farm environment plan and implement a set of good management practices. The plan would then be audited to check that it meets certain standards and that the plan is being implemented." Their report goes on to say "[a] key goal of such an approach would be to lift the performance of inefficient farms with high emissions per unit of product. This could lift the performance of the sector as a whole, given the very wide distribution of emissions across farms."⁶¹
3. Only one option was considered. It was subsequently discarded because this approach cannot guarantee emissions will reduce in line with targets.

Option D (Discarded): Direct regulation

4. The option of direct regulation in this RIA is where the government regulates either inputs, outputs, or on-farm management practices. The three options considered were all discarded. These, and the reasons for discarding were:
 - a. Input controls such as limiting stocking rates or banning the use of certain feeds. This option does not allow for the significant variation within New Zealand's farming systems. For example, an input that results in poor environmental outcomes on free draining soils may pose a much lower environmental risk on heavy soils. It could therefore cause unnecessary costs for little emissions benefit.
 - b. Practice controls such as mandating or banning the use of a technology or practice. This option could reduce emissions by requiring the use of mitigation technologies. As yet, there are no technologies available officials deem to be worth considering this option for. It is possible this could be a tool in the future. An example could be requiring the use of a methane vaccine if one were available and accepted by customers, consumers and our trading partners.
 - c. Emissions limits such as every farm being required to operate within its own emissions limit. The ICCC noted there are variations on this, such as "a maximum emissions limit per hectare, per tonne of product, or per stock unit. Limits could also be differentiated by farm type, region or land use potential."⁶² The ICCC summarised the key reason for discarding this option as follows "With a limits based approach, each farmer would have to achieve the prescribed outcomes on their own farm regardless of how expensive it is for them to do so. Some farmers could make

⁶¹ iCCC report page 52

⁶² iCCC report page 53

IN CONFIDENCE

greater reductions at low cost but have no incentive to do so if they are already below the limit. This is economically inefficient for the sector.”⁶³

⁶³ iCCC report page 53

Appendix B

Brief summary of Manaaki Whenua Landcare Research report “Modelling of agricultural climate change policy scenarios”, August 2019.

Purpose

- To consider the likely changes in biological emissions from agriculture (methane and nitrous oxide), land-use, and net revenue across a range of primary industry sub-sectors, when biological emissions are priced under different scenarios.

Policy scenarios modelled

- The following scenarios were modelled:
 - Farm-level pricing via the NZ ETS, with 95% free allocation (allocated proportionally as a discount)
 - Farm-level pricing via the NZ ETS, with 95% free allocation (decoupled from production and/or current emissions)
 - Farm-level pricing via the NZ ETS with 95% free allocation (decoupled from production and/or current emissions), and when some new technologies are available
 - Processor-level pricing via the NZ ETS with 95% free allocation
 - Farm-level targets for biological emissions.

Key assumptions, limitations and caveats

- Manaaki Whenua used their New Zealand Forestry and Agricultural Regional Model (NZFARM).
- NZ-FARM is a comparative-static, partial equilibrium model of regional New Zealand land use that optimises rural income, accounting for the environmental impacts of land use and land-use changes. Farmers are treated as if they are fully rational profit maximisers who adjust land use and management with complete information about the modelled options available to them.
- The options used in the modelling used the same mitigation assumptions used for analysis commissioned by the Biological Emissions Reference Group.
- The modelling did not consider the impact of breakthrough technologies that could potentially mitigate biogenic methane emissions. New technologies such as methane inhibitors are on the horizon, however assumptions as to the cost of any technology would clearly be estimates at this stage.
- Land conversion costs from one land use to another are not included as the model can't determine which land uses convert to another use. Instead, NZFARM aggregates areas of different land uses, and tracks the changes.
- Forestry, pastoral, arable and horticultural land uses are distributed by land use capability class.
- Carbon dioxide emissions from agriculture are excluded as these are already accounted for in the NZ ETS.
- The impact of other related land use policies, for example freshwater, was not considered so as to focus on the potential impact of climate change policies.
- A 2020 baseline was used for the analysis, using projections generated by the Land Use in Rural New Zealand (LURNZ) model. There is no uptake of mitigation practices included in the baseline used.
- The modelling assumes mitigations are immediately implemented, whereas in reality adoption of mitigations will occur over time.

IN CONFIDENCE

Key results

- The following table summarises some key results from the analysis. We have drawn on other results throughout the RIA. Further results are included in Manaaki Whenua's report.

Table ES1: Estimated change in net revenue and total agricultural GHG emissions for the modelled scenarios (percentage change compared with the 2020 baseline scenario)

Scenarios	Net revenue (% change)			GHG emissions (% change)		
	\$25 tCO ₂ e ⁻¹	\$50 tCO ₂ e ⁻¹	\$100 tCO ₂ e ⁻¹	\$25 tCO ₂ e ⁻¹	\$50 tCO ₂ e ⁻¹	\$100 tCO ₂ e ⁻¹
ETS - farmer point of obligation (95% free allocation)	-0.5	-0.6	-1.2	-0.3	-3.2	-12.5
ETS - processor point of obligation (95% free allocation)	-0.4	-0.5	-0.9	-0.3	-3.1	-12.2
ETS - farmer point of obligation (decoupled 95% free allocation)	0.2	3.4	18	-6	-18	-35
ETS - farmer point of obligation, and technological breakthroughs (decoupled 95% free allocation)	2			-8		
Farm-level GHG emissions reduction targets (GHG price only applied to forestry)	-0.05			-6		

Glossary

Term	What it means...
allocation factor	A measure of the emissions intensity of an activity – such as the production of milk solids or fertilisers – that is used to determine the amount of free allocation of emissions units that a participant in an emissions pricing scheme receives.
allocation rate	The level of assistance provided through free allocation of emissions units to an activity that generates emissions. The current Government has committed to an allocation rate of 95 per cent for agriculture (ie, a discount of 95 per cent on NZ ETS costs).
carbon sequestration	The uptake and long-term storage of carbon dioxide from the atmosphere eg, in vegetation.
Climate Change Response Act 2002 (CCRA)	The Act that provides a legal framework to enable New Zealand to meet its international obligations under the United Nations Framework Convention on Climate Change and the Kyoto Protocol. The Act also provides for the implementation of the NZ Emissions Trading Scheme and the Synthetic Greenhouse Gas Levy.
decoupled allocation	A method of providing free allocation of emissions units where the amount of free allocation is not linked to an emitter's current production or emissions. Two possible options for this type of method include allocating emissions units in proportion to historic emissions (grandparenting), or in proportion to land characteristics (for example, land use class).
emissions	Greenhouse gases released into the atmosphere from human activity.
emissions factor	A value used to convert data on activities that cause greenhouse gas emissions into estimates of actual emissions.
emissions intensity	The relative amount of emissions (eg, methane) that are released by an activity (eg, beef production). This is generally measured as emissions per unit of product produced.
emissions leakage	The risk of production moving to another country with less strict climate change policy, and as a result global greenhouse gas emissions don't decrease overall (ie, the problem is just moved to another country).
emissions pricing scheme	A scheme that is used to reduce emissions by putting a price on them.
extension	Providing advice and education to farmers to improve on-farm management.
free allocation	The Government giving emissions or emissions units to an emitter at no cost.
greenhouse gas	A gas that absorbs and emits radiant energy, contributing to the greenhouse effect around the Earth.
NZ Emissions Trading Scheme (NZ ETS)	The NZ Emissions Trading Scheme is an emissions pricing scheme. It is the main tool New Zealand uses for reducing emissions. Under this scheme, emitters must report and pay for their emissions.
obligation	Emissions that an NZ ETS participant (eg, a factory) is responsible for reporting and paying for under an emissions pricing scheme.
output-based free allocation	A method of free allocation of emissions units where the amount of allocation is based on an emitter's production output.
outputs	The activity that generated the emissions (eg, dairy production), measured by the amount of product that this activity produced (eg, milk solids).
Paris Agreement	An agreement within the framework of the United Nations Framework Convention on Climate Change (UNFCCC) to address climate change after 2020.

IN CONFIDENCE

Term	What it means...
Phase down rate	The rate at which the amount of free allocation of emissions units is reduced. A phase down may need to happen over time to ensure there is a sufficient price incentive to meet New Zealand's emissions reduction targets.
point of obligation	The person (or entity) with the responsibility for reporting and paying for emissions under an emissions pricing scheme like the NZ Emissions Trading Scheme.
processor	A processor of the agricultural products (eg, meat and milk) associated with the production of biogenic methane and nitrous oxide. This includes dairy processors, meat processors, and fertiliser manufacturers and importers.
proportional free allocation	A method of providing free allocation of emissions units where the amount of free allocation is a proportion of an emitter's annual emissions.
unique emissions factors	A special emissions factor that recognises the actions taken by an emitter to reduce their emissions intensity.
\$/tCO ₂ -e	Emissions pricing units - dollars per tonne of carbon dioxide equivalent