Ministry for the Environment
Manatū Mō Te Taiao

New Zealand's 2020 Target – further analysis and options

Date:		**MfE Priority:**	Urgent
Security Level:		**Number of Attachments:**	2
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Action Sought

	Action Sought	**Deadline**
Minister for Climate Change Issues Hon Dr Nick Smith	Direct officials to prepare a Cabinet paper outlining your preferred options for New Zealand's 2020 target.	15 July
Associate Minister for Climate Change Issues (International Negotiations) Hon Tim Groser	None	None.

Ministry for the Environment Contacts

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Executive Summary

The government has committed to announce its position on New Zealand's 2020 target at the next negotiating session on 10-14 August. Decisions on the target can be informed by the following environmental, scientific, foreign affairs and economic factors.

Environmental and scientific factors

- New Zealand's primary interest is in securing an effective long-term global agreement to meet the objective of the UNFCCC to prevent dangerous climate change where New Zealand does its fair share.

- In its latest assessment report the IPCC has advised that stabilising concentrations at 450 parts per million (ppm) of carbon dioxide equivalent (CO_2-e) is achievable if Annex I countries reduce emissions by 25% to 40% below 1990 levels in aggregate by 2020 and non-Annex I countries emissions substantially deviate below baseline.[1] Under this scenario, Annex I emissions would also reduce by 80% to 95% below 1990 levels by 2050.

- The government has stated that it supports a global agreement to stabilise greenhouse gases at no higher than 450 ppm CO_2-e.

- At its recent meeting, the G8 agreed to set a limit of 2 degrees warming (roughly equivalent to 450 ppm CO_2-e) and cut emissions by 80% by 2050.

- New Zealand's 2020 target should be considered alongside these factors and form part of a step to ensuring that New Zealand's long-term target to reduce emissions by 50% below 1990 levels by 2050 ("50 by 50") is achievable.

Economic factors

- Modelling of target scenarios by NZIER and Infometrics, ranging from a 15% above to 40% below 1990 levels suggests that the New Zealand economy will continue to grow out to 2020 under all target scenarios. New Zealand can afford to meet the 2020 targets commonly discussed and still experience significant increases in projected income (measured as Real Gross National Disposable Income (RGNDI) per capita).

- However tougher targets come at a greater opportunity cost. For example, at an emissions price of $100 per tonne a target of a reduction of 15% on 1990 levels is projected to result in an increase in RGNDI of 55% compared to current levels, but this is 2.7% less than what it would be in 2020 if New Zealand does not take part in global efforts to reduce emissions.

- If other countries take on greater commitments and these commitments are reflected in their domestic policies, competitiveness impacts and therefore the costs to the New Zealand economy are likely to be reduced by one third at a low emissions price, and by one half at a higher emissions price. Given this, there are both environmental and economic grounds to justify a more stringent target if other countries also take on stringent targets.

- These costs are for 2020. Assuming the target in the second commitment period (CP2) will lie somewhere between targets in CP1 and 2020, the economic costs will be correspondingly lower in the years leading up to 2020 than the costs in 2020.

[1] Research which fed into the IPCC scenarios specified that these substantial deviations should equal between 15% to 30% reduction below BAU.

- New Zealand will also need to consider costs other than those associated with meeting the target, namely financing for developing countries.

Foreign affairs factors

- New Zealand is now the only Annex I party to not have announced a 2020 target. There is pressure on New Zealand to announce a target at Bonn in August.

- **[Withheld].**

- **[Withheld].**

Indicators to help determine a fair target for New Zealand

- In terms of setting particular targets for New Zealand, an **"equal cost" approach** estimates targets for New Zealand where New Zealand would face a similar economic cost in meeting its target to other countries in meeting theirs. This approach implies lower percentage reductions for New Zealand than for other developed countries, as it takes into account challenges New Zealand faces in reducing emissions, such as our high historical emissions growth since 1990 and projected growth to 2020, and our relatively low mitigation potential.

- While the equal cost approach is an important starting point to consider what a fair target for New Zealand might be, targets based on this approach in isolation are not likely to be well received. Therefore, you may wish to consider other approaches alongside it. Another approach, known as "**contraction and convergence"**, which determines targets based on equal per capita emissions in the long-term, could be considered to moderate the equal cost estimates.

Options for an announcement

While many variants are possible, three options for a target announcement are presented here for illustrative purposes, based on the factors described above:

Option 1: A target range of between 15% <u>above</u> 1990 levels and 10% <u>below</u> 1990 levels depending on the level of global ambition ultimately agreed to. This range has been determined using an "equal cost" approach, where New Zealand faces a similar GDP cost as other parties. The 15% above 1990 end of the range is comparable on a cost basis to the aggregate reductions announced by Parties to date. The 10% below 1990 end of the range is comparable on a cost basis to aggregate reductions by developed countries of 40% below 1990 levels.

Option 2: A target range of between 5% and 20% <u>below</u> 1990 levels depending on the level of global ambition ultimately agreed to. This would use the "equal cost" approach as a starting point but would moderate the target to take into account foreign affairs and environmental considerations. It would also reflect New Zealand's high emissions per capita and the expectations in the negotiations for enhanced action on mitigation, implying our 2020 target be as at least as ambitious as our first commitment period target.

Option 3: This is a variant of Option 1. It is based on equal cost targets for New Zealand compared to Australia's targets. Under this approach, New Zealand would have the following three targets (excluding the effects of LULUCF on Australia's 2020 target):

- a unilateral target of 3% above 1990 levels comparable to Australia's unilateral target of 5% below 2000 levels;
- a target of 8% below 1990 levels comparable to Australia's target of 15% below 2000 levels, conditional on other developed countries taking comparable action; and
- a target of 20% below 1990 levels comparable to Australia's target of 25% below 2000 levels, if global action is on track to reaching 450 ppm CO_2-e or lower.

Conditions and assumptions

The conditions and assumptions underlying the target range should be clearly stated. **Conditions** around the level of global participation underlie both ends of the target ranges identified. Because the final level of global ambition of any agreement is not yet known, the least stringent number within the ranges ultimately settled on would be comparable to the current levels of ambition announced by other countries, and the more stringent numbers within the ranges conditional on greater global ambition than has been announced to date and consistent with 450 ppm CO_2-e.

The targets discussed in this paper are based on important **assumptions** that would need to hold if New Zealand was to meet commonly discussed targets: an efficient global carbon market, unlimited access to international credits and (broadly) retention of the current rules for LULUCF. **[Withheld]**

New Zealand would need to be clear in its announcement that if any of the assumptions no longer hold, it would reserve the right to revise the target accordingly. Other conditions such as seeking flexible land use, and the retention of the Afforestation/Reforestation Debit Credit rule should also be advanced.

Consultation and Next Steps

Consultation to date highlights a range of views on the environmental, economic and foreign affairs issues outlined in this paper. A summary of the views from the consultation is being prepared for the Cabinet paper.

Based on your feedback officials will prepare a draft paper for you to present to the Cabinet Economic Growth and Infrastructure Committee on 29 July.

Recommended Action

We recommend that you:

(a) **Note** that you have committed to announce New Zealand's position on a 2020 target at the next negotiating session on 10-14 August. **Yes/ / No**

(b) **Agree** to propose to Cabinet a net target range conditional on the level of global participation with: **Yes /No**
- the less stringent number in the range conditional on the targets currently announced by countries
- the more stringent number in the range conditional on greater levels of global ambition.

(c) **Agree** to propose to Cabinet that the target range assume: **Yes / No**
- An efficient (deep and liquid) carbon market
- Unlimited access to international emissions reductions in meeting New Zealand's target

- Broadly the current LULUCF rules applying

and that the target could be adjusted if these assumptions do not hold.

(d) **Indicate** which of the following options for a conditional target range should be proposed for consideration by Cabinet:

EITHER

- a range between 15% above 1990 levels and 10% below 1990 levels; **Yes / No**

AND/OR

- a range between 5% and 20% below 1990 levels; **Yes / No**

AND/OR

- a unilateral target of 3% above 1990 levels, a target of 8% below 1990 levels conditional on comparable effort by developed countries, and a target of 20% below 1990 levels if global action is on track to stabilise emissions at 450 ppm CO_2-e. **Yes / No**

AND/OR

- specify another range **Yes / No**

(e) **Refer** this note to the following Ministers:

- Minister of Finance **Yes / No**
- Minister of Energy and Resources **Yes / No**
- Minister of Agriculture and Minister of Forestry **Yes / No**
- Minister of Maori Affairs **Yes / No**
- Minister of Transport **Yes / No**

John Scott **Date**
Acting Manager, Emissions Trading

Referred to Ministry Communications Staff: No

Hon Dr Nick Smith **Date**
Minister for the Environment
Minister for Climate Change Issues

Hon Tim Groser **Date**
Associate Minister for Climate Change Issues (International Negotiations)

Purpose of Report

1. This briefing summarises the major analytical factors relevant to considering a 2020 target, and presents options for announcing a target at the negotiating session on 10-14 August 2009. We seek your guidance on what options you want to present to Cabinet for the target announcement.

2. The paper is structured as follows:

    - **Section 1** outlines the expectations for New Zealand to announce a 2020 target
    - **Section 2** outlines New Zealand's national circumstances, such as its emissions and mitigation potential to 2020 and economic costs of meeting a target
    - **Section 3** explores the international discussions around how to share the effort to reduce emissions between parties through the use of indicators, how other parties have determined their targets and the implications of using different indicators for New Zealand
    - **Section 4** provides three options for a 2020 target range for your consideration
    - **Section 5** describes proposed conditions and assumptions to attach to the target announcement
    - **Section 6** presents different ways to express how the target range could be announced
    - **Appendices** containing further information on:
        - targets announced by other countries' targets (Appendix 1)
        - a range of "equal cost" targets for New Zealand (Appendix 2)

Section 1: Background

International context for a 2020 target

3. Annex I parties (industrialised countries) have been invited to announce emission reduction targets for the year 2020 to signal their commitment to an effective future climate change agreement.

4. New Zealand is now the only Annex I Party not to have announced a 2020 target. The targets announced by other countries range from a return to 1990 levels (the USA[2]) to reductions of 30% below 1990 levels (Norway). In addition, some parties (including the EU and Australia) have announced target ranges depending on the level of global ambition and the commitments agreed to in Copenhagen. A full schedule of other parties announced 2020 targets can be found in Appendix 1.

International Financing

5. New Zealand's 2020 target will be part of a package of international climate change commitments, alongside financing for developing countries. While the fiscal costs of these commitments are not yet known, these commitments should be borne in mind as much as possible when considering an appropriate target.

[2] This is the US administration's preliminary announcement. The American Clean Energy and Security (ACES) Act (the Waxman-Markey Bill) passed in the House includes an economy-wide target of 20% below 2005 levels, and an ETS target of 17% below 2005 levels. The Senate is commencing deliberations on the Bill. While the US is not part of the Kyoto Protocol negotiations, comparability is expected between Kyoto Party and non-Kyoto Party Annex I countries.

6. There is currently a great deal of international uncertainty about the amount of financing for developing countries that will be required[3], what developing countries' actions might amount to, or the governance and accountability arrangements for the use of such finance. Greater clarity on these issues will follow the August negotiating session. Additional Cabinet guidance will need to be sought over coming months on the shape of the total climate change package including guidance on New Zealand's future financial obligations.

[3] **[Withheld].**

Section 2: New Zealand's emissions, mitigation potential and economic modelling results

Projected future emissions without an ETS

7. Figure 1 below shows New Zealand's latest projected gross and net emissions between now and 2020 (and beyond) in the absence of an ETS or new policy measures. We are currently in the process of updating these estimates for the latest results from LUCAS but they will not change materially as a result.

Figure 1 New Zealand's gross and net emissions without measures to 2050 (Mt)

8. Figure 1 shows that gross emissions continue to grow steadily between now and 2020 and are projected to reach about 87 Mt in 2020, or an increase of around 41% on 1990 levels.

9. Net emissions are expected to continue to be less than gross emissions until around 2020, as forests planted in the early 1990s continue to sequester carbon over this period. Beyond about 2020, net emissions begin to exceed gross emissions as forests planted in the early 1990s are harvested, resulting in a significant spike in net emissions from the early 2020s until the early 2030s.

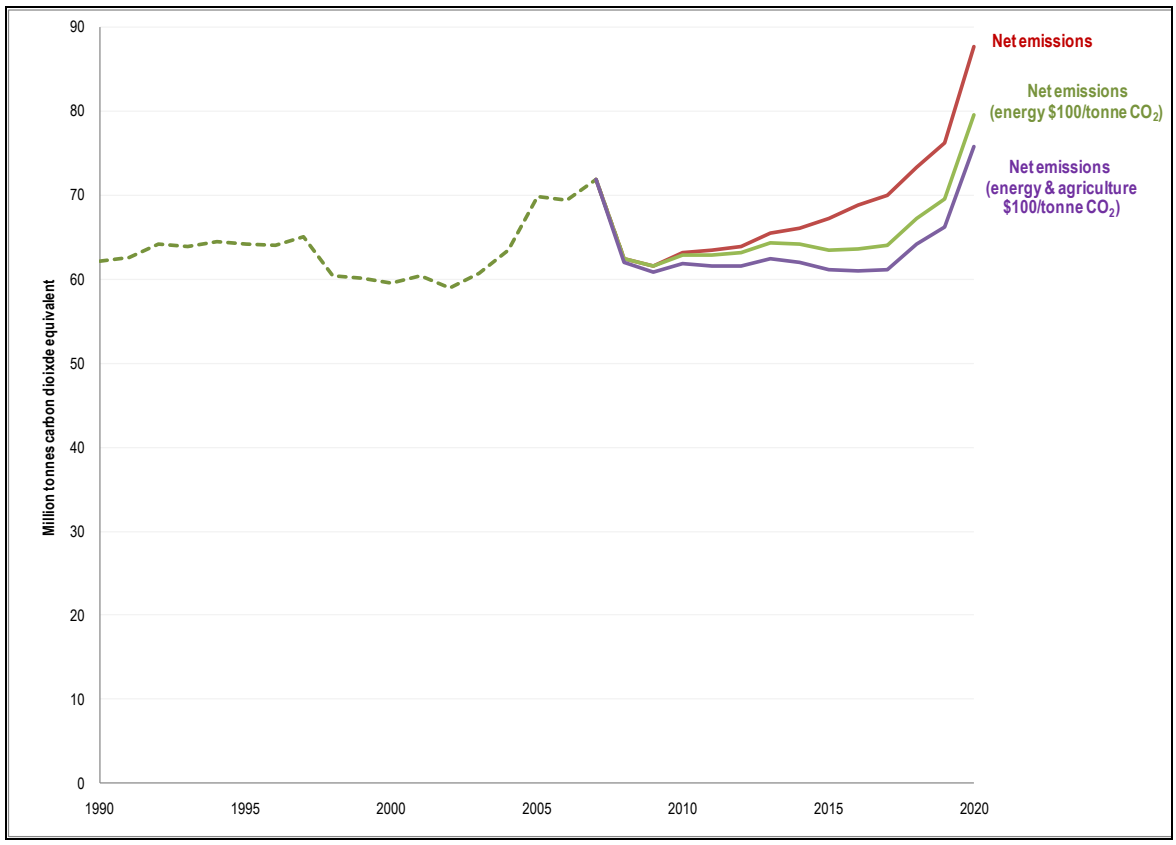
Emission reductions from an ETS – departmental estimates

10. Figure 2 below shows the expected reduction in emissions with an emissions price of $100[4] in place, based on departmental modelling of marginal abatement costs. A consistent emissions price through to 2020 in the order of around $100 a tonne is expected to result in relatively significant reductions in energy emissions below baseline,

[4] All emissions prices in this paper are in $NZ per tonne of carbon dioxide equivalent.

mainly from stationary energy. Comparatively small reductions are expected from agriculture and LULUCF[5].

Figure 2: New Zealand's expected emissions reductions under an emissions price of $100/tonne



Preliminary results of economic modelling

11. MfE recently commissioned Computable General Equilibrium (CGE) economic modelling by consultancies NZIER and Infometrics on the economic impacts of different 2020 targets, and a draft report has now been completed. We will send you a copy of the final report which is expected to be available soon, but key results include:
    - Under all target scenarios, GDP and Real Gross National Disposable Income (RGNDI, which is considered a better measure of economic welfare than GDP[6]) are expected to grow between now and 2020
    - More stringent targets (lower levels of AAUs) result in lower levels of GDP and RGNDI in 2020 than less stringent targets. New Zealand's current GDP is about $180 billion. In a scenario of no action taken to mitigate climate change[7] GDP is expected grow to about $240 billion by 2020. In comparison, with an international obligation on New Zealand to reduce emissions to 1990 levels (i.e. an AAU

[5] Responses to an emissions price in LULUCF are highly uncertain and therefore not shown. Significant reductions in deforestation below baseline are expected as a result of emissions pricing, however the afforestation response is difficult to estimate. An emissions price of $100 creates a strong economic incentive to afforest but long term policy uncertainty means that currently expected actual afforestation is low.

[6] This is because RGNDI reflects the disposable income of New Zealanders rather than the value of goods and services produced (GDP). For instance an increase in the amount of money spent on international purchases of AAUs reduces the amount of disposable income available to New Zealanders and is reflected in RGNDI but does not directly impact on GDP.

[7] i.e. New Zealand does not have domestic measures in place (no ETS) and does not take on an emissions reduction obligation as part of an international agreement.

allocation equal to 1990 emissions) and a $100 emissions price in place, GDP is expected to increase to around $234 billion. An extra 15% of AAU's would soften this impact by less than $0.5 billion

- If New Zealand's competitors take on international action and implement domestic policy, New Zealand will not be at a competitive disadvantage, and the economic cost is reduced by about a third at low emissions prices and by about a half at a higher emissions price.
- Domestic emissions do not change significantly at different emissions prices, with the effect that a significant proportion of New Zealand's target under all scenarios is met through the purchase of emission units offshore. Without international trading in emission units the domestic emissions price and economic impacts are much higher. If further reductions are to be achieved domestically, cost-effective measures complementary to an ETS could be considered to address failure in the carbon market.

12. Table **1** below presents results for three different target levels (15% below 1990 levels, 1990 levels, and 15% above 1990).[8]

13. Some stakeholders (e.g. through Greenpeace's "sign-on campaign") are currently advocating for a 2020 target of a 40% reduction below 1990 levels. Such a target would imply a stringent international agreement, with correspondingly high world emissions prices. Assuming a $200 emissions price this target is estimated to result in a 4.8%-5.6% fall in GDP and 5.7%-6.6% fall in RGNDI relative to a scenario without an international emissions reduction agreement.

Table 1: Macro-economic impacts of different target levels at a $100 per tonne emissions price in the year 2020

Scenario	**World Price**	**RGNDI ($NZ billion 05/06 prices)**		**RGNDI per capita ($NZ)**	
Company	Both	Infometrics	NZIER	Infometrics	NZIER
BAU 2009	N/A	165	165	38,500	38,500
BAU 2020	N/A	232	232	49,000	49,000
+15% AAUs on 1990	$25	231	231	48,800	48,700
+15% AAUs on 1990	$100	229	228	48,500	48,200
1990 level of AAUs	$25	231	230	48,700	48,700
1990 level of AAUs	$100	228	227	48,100	47,900
-15% AAUs on 1990	$25	230	230	48,700	48,600
-15% AAUs on 1990	$100	226	225	47,800	47,500

Implications for meeting a New Zealand target

14. The results of both departmental estimates and economic modelling show that any 2020 target will be met in large part through the purchase of emissions units internationally,

[8] Future world emission prices are extremely hard to estimate, particularly while details of a post-2012 international agreement have not yet been decided. In 2020-2030, we have inferred from IPCC models that prices for the median scenarios are US$45 and US$100 for low (~550 ppm CO_2-e) and high (~450 ppm CO_2-e) global ambition respectively. The Australian Treasury uses prices of US$30 and US$53 for low and high ambition respectively. These emissions prices are ballpark.

assuming no significant new emission reduction policies are introduced. Therefore in order to meet our 2020 target cost effectively it is important that international carbon markets function efficiently with no (or very few) restrictions. For these reasons officials recommend that any target announcement should be conditional on these factors (see paragraph 47 below).

15. The economic modelling shows that under all target scenarios long run economic growth will continue. This is consistent with similar modelling undertaken for other governments as well as previous New Zealand modelling. However, while the overall macroeconomic impacts between different targets do not appear large there are still very large sums potentially at stake. For instance a 15% change in target stringency relative to 1990 equates to a difference in AAUs allocated to New Zealand worth $232 million per annum in the year 2020 at an emissions price of $25, and $928 million at an emissions price of $100 per tonne.

Effect of a 2020 target on future commitment period obligations

16. The announced 2020 target will influence expectations of what New Zealand might sign up to in commitment period(s) leading up to 2020. The obligations implied by the 2020 target for these commitment periods depend upon assumptions around the trajectory between the end of CP1 and the 2020 target, and what the emission starting point is for tracing that trajectory.[9]

17. In addition, the 2020 target also has potential implications for the longer term management of New Zealand's emissions and the path towards achieving the 2050 target ("50 by 50"). **[Withheld]**.

[9] While a 2020 target is likely to influence New Zealand's commitments across the second and third commitment periods, there is no agreed approach to determine either the starting point or the trajectory from 2013 to establish what the CP2 target will be. CP2 commitments of parties will be subject to later negotiation. It is almost certain that the annual costs in CP2 will not be as large as those estimated in 2020.

Section 3: Indicators of comparable effort to help determine a 2020 target

Indicators to inform a New Zealand target comparable to those of other industrialised countries

18. There are a number of indicators that can be used to determine fair effort between industrialised countries. The advantages and disadvantages (in terms of how well they reflect the principles of "comparable effort" rather than their implications for New Zealand) of the major approaches are briefly described below.

19. The **cost of meeting a given target as a percentage of GDP** (referred to herein as the "equal cost" approach), has the advantage that each country carries the same burden for reaching an emissions reduction goal and richer nations have higher absolute costs than poorer nations. Disadvantages of the approach are that the BAU projections are based on a number of assumptions about the future state of economies and that efforts to reduce emissions in the past are not acknowledged.[10]

20. The "**GDP per capita**" approach reflects the capability to pay for emissions reductions. An advantage of the approach is that countries with higher per capita income pay more. A disadvantage of the approach is that it could potentially penalise richer but more carbon efficient countries (i.e. does not recognise any decoupling of economic growth from environmental harm).

21. The "**Emissions per capita"** reflects the premise that all people should have equal rights to use the atmosphere. "Contraction and convergence" is one approach encompassing this, whereby countries, in the long-term, are given the same target on a per capita basis. Its advantages are that it would encourage participation of all countries (and therefore create a global carbon market, as countries with lower than average GHG per capita would be able to sell credits), and more accurately reflects responsibility for emissions reductions than the approaches described above. A disadvantage is that it ignores several important national circumstances such as availability of renewable resources, climatic differences and consumption patterns.

22. The **"past emissions" approach** reflects historic responsibility for climate change. An advantage of the approach is that it is based on "polluter pays" principle so countries pay for what they have emitted in the past. A disadvantage of the approach is that it removes focus from current and future emissions.

A New Zealand target under each indicator

23. Under the **equal cost** approach, New Zealand has relatively smaller reductions as a percentage on 1990 levels than other Annex I countries. This is because the equal cost approach reflects our high expected emissions growth to 2020, due in part to our high population and economic growth and low mitigation potential, in particular in the agriculture and stationary energy sectors. For example, Australia's targets of 5%, 15% and 25% below 2000 levels give "equal cost" targets for New Zealand of +3%, -8% and -20% on 1990 levels respectively[11]. Further examples and explanation are provided in more detail in Appendix 2.

[10] Conversely, strong emission growth since 1990 results in a relatively less stringent target relative to 1990, perversely some would say.

[11] These figures are excluding LULUCF for New Zealand and Australia. In accordance with Article 3.7 of the Kyoto Protocol, the base year for Australia will include a significant net volume of emissions from LULUCF. This is taken into account for both base year and emissions trends since 1990, the target figures for Australia, and correspondingly for New Zealand, would not be as deep.

24. Current **emissions per capita** give generally more stringent targets for New Zealand than the Annex I average, due to our emissions per capita being about 20% higher than for the average for Annex I parties (lower only than the US, Australia and Canada when the EU is taken as a block).

25. **GDP per capita** gives generally less stringent targets for New Zealand than the Annex I average.

26. **Past emissions** (cumulative emissions over the period 1990-2005[12]) gives generally more stringent targets for New Zealand than the Annex I average due to New Zealand's increase in emissions during that period.

27. Table 2 shows targets for New Zealand for an aggregate Annex I 30% reduction on 1990 levels using different indicators, undertaken by the International Institute of Applied Systems Analysis (IIASA), the Netherlands Environmental Assessment Agency (NEAA), the European Commission and an independent study for the Ministerial Greenland Dialogue.

Table 2: New Zealand targets under different indicators for a 30% aggregate Annex I reduction

Indicator	Aggregate Annex I target on 1990 levels	Study	New Zealand target on 1990 levels
Equal cost	-30	IIASA	+1%
		Greenland dialogue*	+16%
Emissions per capita	-30	EC	-39%
		NEAA *	-25%
GDP per capita	-30	EC	-23
		Greenland dialogue*	-16
Past emissions	-30	Greenland dialogue*	-35

* target is for New Zealand and Australia jointly

Indicators used by other countries in setting their targets

28. Other countries have drawn on a number of different indicators to determine their 2020 targets, in many cases taking into account multiple approaches. There is no consensus as to a single approach or combination of approaches that should be used. However, an understanding of the factors other countries used can be useful to deciding a New Zealand target.

29. Australia took into account two approaches to determining a 2020 target: emissions per capita[13] and equal percentage reductions below BAU emissions for all developed countries.[14]

30. Japan also used two approaches: one based on what reductions could be achieved if certain actions were taken (interpreted to mean domestic technical feasibility) and the other focused on fairness among industrialised countries by sharing the costs of reducing emissions.

[12] Other methods use pre-industrial revolution start years of 1750 and 1890.
[13] It assumed Australia takes on its proportionate share of global mitigation on a per capita basis, where per capita emissions 'contract' and converge' in 2050.
[14] Where groups of countries at different levels of development take on reductions at slower rates and in later years. This approach to an extent takes into account the relative cost on economies.

31. The European Commission proposed four indicators: GDP per capita; GHG per unit of GDP; trend in emissions between 1990 and 2005; and population trends over the period 1990 to 2005.

Section 4: Options for a New Zealand 2020 target range

32. As the above discussion illustrates, there is no single internationally accepted approach to setting emission reduction targets for 2020. Ultimately a judgment has to be made, but the above indicators can be useful in making that judgment.

A target excluding agriculture

33. Some have suggested that New Zealand should seek to exclude agriculture from a future agreement. Officials would not recommend this. The equal cost approach to determining a New Zealand target already takes account of the difficulties in reducing agricultural emissions (and also recognises difficulties other nations may have in reducing emissions from other sectors). Therefore, officials consider that a 2020 target excluding agriculture is not necessary. **[Withheld]**.

A target assuming best possible outcomes

34. **[Withheld]**.

35. New Zealand could reserve the right to progressively reduce the target if these outcomes do not eventuate. **[Withheld]**.

Target range based on the equal cost approach

36. The equal cost approach provides a useful starting point for an analysis of possible target ranges, but there are a number of criticisms to determining a target purely on a cost basis. In addition, while the approach has some international recognition, no other Annex I Party has relied upon it in isolation in developing its target.

37. Use of the equal cost approach would also result in positive targets for New Zealand relative to 1990 for most levels of global ambition. This runs counter to the expectation that parties will announce 2020 targets that result in greater emission reductions than for CP1 (as the Bali Action Plan calls for "enhanced action on mitigation"). In its fourth assessment report the IPCC's main description of scenarios consistent with atmospheric concentrations at 450 ppm CO_2-e has aggregate Annex I reductions of between 25% and 40% below 1990 levels.[15] While there is an understanding that individual countries targets can lie outside the range **[Withheld]**.

[15] In addition, non-Annex I countries under this scenario undertake "substantial deviation from baseline in all regions".

38. Notwithstanding these points, the equal cost approach usefully illustrates that New Zealand faces a more difficult challenge in reducing its emissions than for most other Annex I countries, and that a smaller percentage reductions for New Zealand relative to many other Annex I countries may be justifiable.

39. If you wish to base a 2020 target purely on an equal cost approach, this would result in a range between +15% and -10% on 1990 levels (depending on the level of global ambition). The +15% target would equate (on an equal cost basis) approximately to currently announced 2020 targets by other parties, with -10% dependent on much higher levels of global ambition. A variant on this would be to obtain targets for New Zealand based on Australia's targets. On this basis, the targets could be 3% above 1990 levels, 8% below 1990 levels and 20% below 1990 levels (equivalent to Australia's 5%, 15% and 25% reductions below 2000 levels respectively).[16]

Target range drawing on other factors

40. A range more similar in terms of percentage reductions on 1990 levels to that of other parties, which shows a greater level of commitment to long term global emission reductions and signals to the international community that New Zealand supports ambitious global action on climate change, would require a target range with greater reductions. New Zealand could still rely on the equal cost approach to justify a somewhat less stringent target (taking into account New Zealand's unique national circumstances) but moderate the range by drawing on the emissions per capita approach. A target range of between 5% and 20% below 1990 levels may be appropriate. For this range the 1990 end would be based on current announced target levels with a 20% reduction being dependent on much higher levels of global ambition than have currently been pledged.

Possible target range options to present to Cabinet

41. There are a variety of different target ranges that you could present to Cabinet. Three possible options for 2020 target ranges based upon the discussion above are:

    - Option 1: A range between an increase of 15% on 1990 levels and a decrease of 10% on 1990, dependent on the level of global ambition.

    - Option 2: A range of between 5% and 20% below 1990 levels, dependent on the level of global ambition.

    - Option 3: A unilateral target of 3% above 1990 levels and a range of between 8% and 20% below 1990 levels, dependent on the level of global ambition.

42. Officials recommend that conditions and assumptions, discussed in the following section, should be attached to whatever option is ultimately agreed.

[16] These figures are excluding LULUCF for New Zealand and Australia. In accordance with Article 3.7 of the Kyoto Protocol, the base year (1990) for Australia includes a significant net volume of emissions from LULUCF. If this is taken into account for both base year and emissions trends since 1990, the target figures for Australia, and correspondingly for New Zealand, do not appear to be as deep.

Section 5: Conditions and assumptions attached to the target range

43. Officials recommend that the target range should be dependent on a number of factors. These fall into two categories:

    - *Conditions*. These determine where in the range announced in August New Zealand's final target will ultimately fall. Current uncertainty about these factors is the motivation for choosing a range rather than a single number.

    - *Assumptions*. These are factors that were used in analysing the implications of the target ranges. Deviations from these assumptions could significantly affect the ability of New Zealand to meet a particular target. Because of this, New Zealand would reserve the right to reconsider the target range announced in August if these assumptions are not met.

Conditions

44. Expressing the target as a range allows decision makers to exercise judgment as to what a fair target is for New Zealand within that range, as the negotiations progress and greater clarity around the level of global ambition emerges.

45. For instance the most stringent end of the New Zealand target range could be adopted if global reductions are on track to ensure atmospheric concentrations of greenhouse gases become no higher than 450 ppm CO_2 equivalent at stabilisation.

46. Conversely, the least stringent end of the range could be adopted if current announcements by parties are reflected in the final agreement. Stating a range dependent on the level of global effort is consistent with a New Zealand approach of doing our 'fair share' to reduce emissions relative to the actions of other countries, while also reflecting economic modelling which show that the costs to the New Zealand economy of taking action to reduce emissions are lower with greater levels of global participation. For example:

    > *New Zealand is committed to a target of between x% and % on 1990 levels. Where New Zealand lies within its target range depends on the level of global effort, including both the commitments by Annex I and other developed countries, and action taken by developing economies.*

Assumptions

47. A number of assumptions were made in analysing possible 2020 target ranges for New Zealand. Officials recommend that, if developments during negotiations mean these assumptions no longer hold, the target range may need to be reconsidered. The announcement of the target will need to be clear about the assumptions. While it is likely within that these assumptions are likely to hold in a future climate change agreement, officials recommend New Zealand should reserve the right to reconsider its target on the basis of the following key factors that will heavily impact on New Zealand's ability to meet a particular target/target range:

    - An efficient (deep and liquid) global carbon market. Because New Zealand will be a net buyer of credits an efficient carbon market will be important to meeting our obligations at least cost.
    - Unlimited access to international emission reductions in meeting New Zealand's target (i.e. no quantified supplementarity requirement). Because New Zealand is

likely to be a net buyer of credits, unlimited access to international credits will substantially lower the overall cost to New Zealand in meeting any given target.

- Current LULUCF rules apply **[Withheld]**.

LULUCF rules

48. On current rules for accounting for LULUCF emissions and removals, this sector is not projected to have a large impact on net emissions in 2020. However, depending on the outcome of international negotiations, different rules to those currently in place could be agreed to that could have a large impact on net emissions in 2020 and New Zealand's ability to meet a particular target.

49. **[Withheld]**.[17]

[17] [Withheld].

[Withheld].

Section 6: The expression of the 2020 target

53. The way that a target is expressed can help to influence perceptions of the relative level of ambition of that target. This could be particularly important if the target that is announced is seen as not as ambitious as the targets for other countries. However even for a more ambitious target/target range, the way that it is framed can be extremely important for domestic and international audiences alike.

54. Options for expressing the 2020 target include:

- **Using different base years**. A number of countries have expressed their targets relative to base years later than 1990 when emissions are higher than 1990 levels. For instance a reduction of 5% relative to 1990 levels can be converted to a reduction of about 25% relative to gross emissions in 2006, which is a useful way of illustrating the true extent of reductions actually required. However, although the more recent base year comparison will make the target appear more ambitious, it will be easy to convert the recent base year target to a 1990 base year **[Withheld]**.

  Officials therefore recommend that the target should be expressed relative to both a more recent base year and to 1990 emissions.
- **Expressed as a per capita reduction**. Countries that have had strong population growth since 1990 can create the perception of having a more stringent target by expressing their target in per capita terms. New Zealand has had high population growth since 1990 and this is expected to continue through to 2020. **[Withheld]**.

  For instance a 5% reduction on 1990 emissions could be expressed as a reduction of approximately 30% on a per capita basis between 1990 and 2020. Officials therefore recommend that any target announcement should be explained both in terms of absolute reductions and per capita reductions.
- **Split between different gases (CO_2, CH_4, N_2O).** It is possible to break a target into sub-targets for different gases. This could done to, for instance, emphasise the relative difficulty in reducing agricultural methane emissions. However expressing the target in this way is also likely to confuse, and in any event sectoral considerations could be explained as part of the background to the announcement. For this reason officials recommend that the target not be expressed split between different gases.

55. Decisions will need to be made about how the 2020 target/target range is to be announced following the public meetings and Cabinet decision on the target and its

conditions. We can brief you on options for expressing the target when we have a clearer idea of what the final announcement will be. However given the importance of explaining the target to both domestic and international audiences officials recommend that a document explaining the target in a number of different ways should accompany the announcement.

Section 7: Consultation

56. From consultation to date, the public meetings have largely focused on avoiding the risks of climate change, with many in support of a 2020 target of 40% below 1990 levels (associated with the 'sign-on' campaign). Business meetings have focused more on the costs to business and the economy and ensuring the costs are manageable. A more detailed summary will be provided in the Cabinet paper.

Appendix 1: Targets announced by other parties

	Low pledge	High pledge	LULUCF	Use of international carbon markets
EU-27	-20%	-30%	No for -20 Yes for -30	Some restrictions
USA	0%	-4%*		Some restrictions
Russia	-10%	-15%		TBD
Japan	-9%		No	No
Canada	-3%*			No
Australia	-4%*	-24%*	Yes	TBD
Ukraine	-20%			TBD
Belarus	-5%	-10%		Yes
Norway	-30%		Yes - current rules	Some restrictions
Switzerland	-20%	-30%	Yes	TBD
Iceland	-15%		Yes	TBD
Liechtenstein	-20%	-30%	No	TBD

*(adjusted to 1990 levels for ease of comparison)
**outlined in Waxman-Markey proposal

Appendix 2: equal cost targets for New Zealand compared with countries

The table below presents targets for New Zealand estimated by assuming an equal percentage reduction in GDP to that of other countries for a range of different 2020 targets. The equal cost approach is based on the premise that fair targets should result in an approximately equal as a percentage of GDP in each country. Calculation of the costs of reaching different targets is based on business as usual (BAU) emission projections for each country, the amount of abatement that can be achieved at different emissions prices (including the costs of taking responsibility for emissions reductions offshore), and countries' relative income levels.

Scenario for a NZ 2020 target	1990	2006	2020	per capita*
Annex I aggregate -40% on 1990 (to stablise at 450 ppm CO_2-e)	-7%	-26%	-31%	-33%
Annex I aggregate -15% on 1990 (aggregate of current pledges)	16%	-8%	-14%	-16%
Australia -25% on 2000 (if global emissions on track to achieve 450 ppm CO_2-e)	-20%	-36%	-40%	-42%
Australia -15% on 2000 (if international effort)	-8%	-26%	-31%	-33%
Australia -5% on 2000 (unilateral effort)	+3%	-18%	-23%	
EU -30% on 1990	10%	-13%	-18%	-21%
USA 0% on 2006	15%	-9%	-15%	-20%