

Office of the Minister for Climate Change Issues

Cabinet

International Climate Change: New Zealand's unconditional 2020 target

Proposal

1. This paper seeks agreement to a credible and affordable greenhouse gas target for the period 2013 to 2020. Decisions are sought on the form, level and acceptable cost of New Zealand's unconditional 2020 responsibility target.¹
2. I propose an unconditional target of a 5 per cent reduction in greenhouse gas emissions on 1990 levels by 2020. I also propose that we apply the Kyoto Protocol framework of rules to our 2020 target to ensure that New Zealand's actions are transparent and have integrity. Our existing, conditional pledge will remain, should our target conditions be met prior to 2020.²
3. Our 2020 target would be publicly announced following Cabinet decisions.

4.

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Executive summary

5. The Prime Minister has stated that New Zealand will announce an unconditional 2020 climate change target this year. This will allow us to participate meaningfully in the international negotiations currently under way (due for completion by December 2015) for a post-2020 climate change agreement.

¹ This target would be 'unconditional' in that it would have no specific international conditions attached, in keeping with the unconditional targets of other developed nations. A responsibility target means that New Zealand can meet its target through a mixture of domestic emission reductions, the sequestration of carbon in forests, and the purchase of emissions reductions in other countries.

² New Zealand is prepared to take on a responsibility target for greenhouse gas emissions reductions of between 10 and 20 per cent below 1990 levels by 2020, if there is a comprehensive global agreement (CAB Min (09) 28/9 refers). This means:

- a) That the global agreement sets the world on a pathway to limiting temperature rise to no more than 2 °C;
- b) That developed countries make comparable efforts to those of New Zealand;
- c) That advanced and major-emitting developing countries take action fully commensurate with their respective capabilities;
- d) That there is an effective set of rules for LULUCF;
- e) That there is full recourse to a broad and efficient international carbon market.

6. Our target must be affordable and demonstrate that New Zealand is doing its 'fair share' to address global climate change. In practical terms, this requires our 2020 target to be set at a level that can be supported by domestic climate change policy settings and of comparable ambition to the targets of other countries.
7. A 2020 target of -5 per cent on 1990 levels could be met through existing domestic policy settings, so would not incur new costs for New Zealand households or businesses. Such a target would also demonstrate New Zealand doing its fair share towards international climate change efforts, as it would be broadly in line with the actions of comparator countries.
8. A -5 per cent target is consistent with our international positioning to date. It would demonstrate New Zealand's commitment to climate change action while reiterating our expectation of a comprehensive global response.
9. We will continue to negotiate rules in the transition to 2020 that will better encourage the broadest country participation required for a global agreement and that are able to accommodate our national circumstances post-2020.

Background

10. In November 2012, Cabinet (CAB Min (12) 39/5 refers) agreed that:
 - New Zealand will not take a [Kyoto Protocol] commitment but will instead take a post-2012 target under the [United Nations] Convention track, and
 - Officials [will] prepare advice for a Cabinet decision on the level of New Zealand's mitigation ambition and the content of the Kyoto Protocol framework it would apply if taking a Convention track target, once an assessment has been made of the [December 2012] Doha meeting's outcomes.
11. To date, our Kyoto Protocol commitment has been the focal point for our national climate change undertaking, and a key reference underpinning domestic climate change policy and rules within the New Zealand Emissions Trading Scheme (ETS).
12. New Zealand's decision to remain a Party to the Kyoto Protocol but take its next mitigation target under the United Nations Framework Convention has drawn some negative attention. Countries are now, however, firmly focussed on the post-2020 regime – a comprehensive agreement that will contain commitments by both developed and developing countries, and on the same legal basis. The rules and conditions of this new agreement are currently being negotiated and are scheduled to be agreed within the next two years. The content of this new agreement will shape the form and costs of future climate change commitments for New Zealand.
13. New Zealand seeks an international outcome that is environmentally effective, ambitious and rules-based. This is only possible with broad participation from all of the world's major economies, and the flexibility to accommodate evolving national and economic circumstances.

14. I propose that we take decisions now on an unconditional 2020 greenhouse gas emissions target that signals New Zealand's commitment to climate change action, reiterates our expectation for successful negotiating outcomes and that sits alongside our existing 2020 conditional target range. The Prime Minister has said New Zealand will name a firm target this year, allowing New Zealand to participate meaningfully in the negotiations currently under way and to influence the shape of a post-2020 climate change agreement.
15. Extensive public consultation on a 2020 climate change target for New Zealand was performed in 2009. Over 1600 people attended meetings across New Zealand, and over 150 written submissions were received. The details of this consultation and the resulting conditional target range are contained in CAB Min (09) 28/9. The target range and conditions resulting from this consultation remain on the table.
16. Decisions in this paper will demonstrate that New Zealand is doing its 'fair share' to address global climate change; ensure that New Zealand's next target is affordable; and support a sensible transition to a comprehensive post-2020 climate change agreement.
17. Determining New Zealand's unconditional 2020 target requires a number of considerations, including:
 - i. New Zealand's long-term climate policy objectives, our domestic policy settings and broader sustainable development objectives, e.g. the Business Growth Agenda;
 - ii. The form, level of ambition and cost, including the degree to which New Zealand's existing 2020 target conditions have been met; and
 - iii. The rules we would apply i.e. what and how we would count greenhouse gas emissions and removals.³

1. New Zealand's long term climate policy objectives, including domestic policy settings, and broader sustainable development objectives

18. A key climate change objective for New Zealand is to secure an effective long-term global agreement. Many countries have begun to take action on climate change. For example, over 40 countries have either implemented or are implementing policies that place a price on greenhouse gas emissions. New Zealand will also continue to play its part and contribute towards global efforts. We have already committed to reduce greenhouse gas emissions by 50 per cent from 1990 by the year 2050. This is a stiff challenge given that half of our current emissions come from agriculture.
19. In achieving this longer-term objective we must also maximise short and medium-term economic and environmental benefits. This is consistent with the Government's Business Growth Agenda that seeks to make better use of our natural resources so we can continue to grow our economy and look after our environment.

³ Removals are activities which absorb greenhouse gases from the atmosphere e.g. growing forests.

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21. Our existing climate change policy response includes the ETS, our leadership of the Global Research Alliance on agricultural emissions, and the financial and technical support we provide to our Pacific neighbours – these efforts (coupled with an unconditional 2020 target) should be presented as a coherent and whole package i.e. an effort that extends far beyond a simple percentage reduction target. Transitioning to a low-emissions economy means we will need to continue to:

- Boost the resilience of our domestic economy whilst doing our fair share towards global mitigation efforts (e.g. by improving economic productivity and increasing New Zealand's competitiveness while at the same time reducing emissions);
- Exploit opportunities that leverage our comparative advantages and improve the competitiveness of New Zealand industry (e.g. maximising the value of the 'NZ inc' brand and our knowledge and expertise in the land based and renewable energy sectors);
- Send clear signals that encourage private sector investment in technologies and know-how to ensure we make the best use of our natural resources; and
- Promote and present New Zealand's actions transparently so as to meaningfully participate in and influence a new, comprehensive, global climate change agreement.

II. The form, level and cost of an unconditional 2020 target

22. Under the Kyoto Protocol, the form of our target was expressed as a percentage reduction relative to 1990 levels, applied to a period of several years (referred to internationally as a 'carbon budget'). Maintaining this form of target to 2020 would provide consistency with domestic policy settings and clearly communicate New Zealand's intentions internationally.⁴ There are few, if any, convincing arguments why we should move away from our existing approach at this time.

23. A target will be scrutinised for its comparison with what others are doing – often evoking assessments based on self-elected metrics of 'fair share'. If there is any lesson to be drawn from international climate negotiations, in respect of comparability, it is that there is no universal formula to calculate what a country 'should do' in respect of its own level of ambition. In practice, a target will be based on a multitude of factors, including a country's unique circumstances and capability.

⁴ Benefits to New Zealand include consistency with our use of carbon markets, and the flexibility to reflect forestry harvesting cycles and other aspects of our unusual emissions profile

24. In the case of New Zealand, a large proportion of our electricity generation already comes from renewable sources, almost 50 per cent of our emissions come from food production and other agricultural activity, our population is forecast to continue to grow significantly and our small, dispersed population provides few opportunities for economies of scale. International estimates of comparative cost show it is more difficult for New Zealand to reduce its emissions than most other developed countries.
25. Table 1 shows and compares the 2020 targets of other developed countries relative to 1990. It also presents three metrics, demonstrating the range of ways the adequacy of a target could be judged. Additional detail is provided in Appendix 2.

Table 1: 2020 targets and comparability metrics for developed countries

Country	2020 Target relative to 1990 levels	Projected BAU 2020 emissions per capita (Gg/thousand people) ⁵	Projected BAU 2020 emissions intensity (Gg/\$billion GDP PPP)	Comparative mitigation cost of target in 2020 (% GDP) ⁶
Australia	-4%	23.1	589	0.06 - 0.13%
Canada	+3%	20.2	508	≤0.00%
EU-27	-20%	10.0	313	≤0.00%
New Zealand	Proposed -5%	17.0	574	0.19%
Japan	-25% ⁷	10.7	325	0.04%
Norway	-30%	9.6	184	0.15%
Russia	-15% to -25%	17.6	949	≤0.00%
United States	-3%	23.1	589	0.00%

26. New Zealand has previously tabled an aspirational 2020 target range based on a set of conditions (see footnote 2); this signals the ambition we would aspire to in the context of a comprehensive global agreement. The aggregate of targets put forward by countries to date falls well short of the reductions required for an 'effective' global response.⁸ It is clear that this and other conditions have not yet been fully met.⁹ As a result, our own level of ambition at this point in time will be lower than would otherwise be the case.

⁵ 'BAU' is business as usual emissions, i.e. under current policy settings. 'Gg' is gigagrams of carbon dioxide equivalent.

⁶ This comparability information is sourced from publicly available international data. Cost figures are a useful indicator of the relative costs of each country meeting its target, but are based on a range of assumptions so are not likely to be accurate indications of the absolute GDP impacts (for example, New Zealand's use of its Emissions Trading Scheme to meet its target). These relative estimates assume a \$25 carbon price and exclude removals from forests.

⁷ Japan will review this target in light of the earthquake, tsunami and Fukushima Daiichi nuclear disaster.

⁸ United Nations Environment Programme, 2010.

⁹ For example, the targets pledged by Parties to date are not sufficient to set the world on a pathway to limiting temperature rise to no more than 2 °C.

27. At the 2012 United Nations meeting in Doha it was decided that countries, such as New Zealand, who did not take a target under the second commitment period of the Kyoto Protocol will face restricted access to international Kyoto markets. New Zealand's target in the transition to 2020 will need to reflect this restriction and its implications for our domestic policy.¹⁰
28. The cost of a target will depend on its consistency with domestic climate change policy settings. Our ETS is designed to help New Zealand meet its international climate change obligations. The ETS provides the Crown with international units that can be used to meet a 2020 target.

29. Withheld under section 9(2)(j) of the OIA, to enable the Crown to carry on negotiations without prejudice or disadvantage

30. Targets of 0, -5 and -10 per cent on 1990 levels correspond to a fiscal cost of \$54.81m, \$67.78m and \$80.74m respectively (based on current international unit prices). In determining these costs, a key assumption is that we will be able to recognise our over-achievement from our previous commitment (2008 - 2012) for use against an unconditional 2020 target (in line with international rules for commitments under the Kyoto Protocol). More detail is provided in Appendix 1.
31. The level of this fiscal cost may change over time in line with international market prices. Officials do not anticipate any significant upward pressure on international carbon prices between now and 2015, and most market analysts forecast that prices will stay below NZ\$2 for this period. A range of historic international unit prices is listed in Appendix 1.
32. The cost of meeting the target would be recorded in the Crown accounts as a fiscal risk. The Government would recognise a liability and corresponding expense when the processes for writing off international units to meet a 2020 target are formally established.

III. Rules considerations for an unconditional 2020 target

33. The Kyoto Protocol rules specify how Parties to the Treaty must measure, record and report on their greenhouse gas emissions. The rules also set out processes for international peer review and the requirements for carbon trading between countries.

¹⁰ New Zealand has lost access to some forms of Kyoto units but retains access to others. The broad direction of international carbon markets and New Zealand's access to them after 2015 is uncertain.

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34. Many of the Kyoto rules relate to transparency of actions. Transparent actions, international methodologies and international peer review will be a key feature of the post-2020 agreement as Parties move to a regime that includes an element of flexibility to account for national circumstances. Because New Zealand remains bound to some reporting obligations as a Party to the Kyoto Protocol, and such reporting will remain important after the year 2020, it makes sense to maintain these functions and systems as part of our 2020 target – this is what we do already.
35. In the longer-term, it will be beneficial to transition to alternative rules that better encourage the broad participation of all countries under a global agreement. For New Zealand, some flexibility is enabled through our decision to take a target under the Framework Convention, rather than the Kyoto Protocol.
- 36.

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Comment

37. I propose that New Zealand announce now, an unconditional 2020 greenhouse gas responsibility target of 5 per cent below 1990 levels. This target would:
- Present an affordable level of ambition, i.e. one that is supported by current domestic policy settings and does not change ETS costs to households or businesses or require the purchase of additional international carbon units by Government;
 - Demonstrate that New Zealand is doing its fair share towards international climate change efforts, as it is broadly in line with the actions of comparator countries;
 - Be consistent with our international positioning to date by demonstrating New Zealand's commitment to climate change action while reiterating our expectation of a comprehensive global response. It would provide flexibility to increase our ambition over the next eight years should the actions of other countries warrant this; and
 - Imply a fiscal cost of approximately NZ\$67.78 million (based on current carbon prices).
38. In my view there is little benefit to New Zealand implementing non-Kyoto rules at this stage. I propose that New Zealand measure progress against its 2020 target as if we had made a commitment under the Kyoto Protocol (i.e. using the Kyoto framework of rules). These rules are supported by our existing measurement and reporting systems, in line with our Framework Convention announcement made in 2012 and would position New Zealand well internationally.

39. The Kyoto framework includes reporting on our emissions, using internationally agreed accounting methodology and recognising our over-achievement from the Kyoto Protocol's first commitment period (2008 - 2012) for use against this new unconditional target. In practice, we would communicate our intention to apply the Kyoto Protocol's commitment period two rules, changing only those things which need to be changed because we have set our target under the Framework Convention.
40. In applying the Kyoto Protocol rules to a 2020 target New Zealand will not be applying a forestry accounting rule that we have previously negotiated for: the Afforestation Reforestation Debit Credit Rule (ARDC) which is legislated within the ETS. However, this does not change New Zealand's principled negotiating position that a future climate change agreement must more effectively provide for plantation forests in order to secure broad participation. Further analysis is included in Appendix 1.
41.

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42. Our 2020 target would be publicly announced after a Cabinet decision.

Consultation

43. Public consultation on a target is not formally required, and in my view there would be little value to be gained from additional consultation beyond what has been completed to date. Public consultation on New Zealand's 2020 emissions target occurred in 2009 and a total of 317 written submissions were received, including submissions from 18 major stakeholder groups. Approximately 54 per cent of submissions recommended a target of at least -10 per cent on 1990 levels. Approximately 25 per cent recommended a 'cautious' target, a business as usual approach or expressed their scepticism of climate change. The conditional target range determined as a result of this consultation remains on the table, subject to those conditions being satisfied.
44. The following departments were consulted in the development of this paper: Ministry of Foreign Affairs and Trade, Ministry for the Environment, the Treasury, Ministry for Primary Industries, Ministry of Transport and the Ministry of Business, Innovation and Employment. The Department of Prime Minister and Cabinet and Te Puni Kōkiri have been informed.

Financial implications

45. The estimated fiscal costs of a -5 per cent target are \$67.78 million based on the latest monthly carbon price (i.e. July 2013) used for valuing international carbon units in the Government's financial statements. The costs of a 2020 target would be recorded as a fiscal risk in the Crown accounts, and as a liability when the processes for writing off international units to meet a 2020 target are formally established.

Human rights

46. There are no inconsistencies with the Human Rights Act 1993 or New Zealand Bill of Rights Act 1990.

Regulatory impact analysis

47. The decisions sought in this Cabinet paper do not involve creating, amending or repealing primary legislation or delegated legislation that is a regulation for the purposes of the Regulations (Disallowance) Act 1989. These decisions involve no direct impacts on businesses, individuals or not-for-profit entities beyond those of existing climate change policies. Neither do decisions seek the ratification, accession, acceptance or approval of an international treaty by New Zealand.

Publicity

48. Decisions in this paper are likely to attract domestic and international attention.
49. A communications plan has been developed to be used in conjunction with announcing this target.

Recommendations

50. The Minister for Climate Change Issues recommends that the Committee:
1. note that the Government has signalled an intent to announce an unconditional 2020 target in 2013 (CAB Min (12) 39/5 refers)
 2. note that an unconditional 2020 target should demonstrate New Zealand is doing its 'fair share' to address climate change; ensure New Zealand's target is affordable; and provide for a sensible transition to a post-2020 international climate change regime that is appropriate for New Zealand's circumstances
 3. note that a -5 per cent target will impose no additional costs to households or businesses, and is supported by existing Emissions Trading Scheme settings
 4. note that the fiscal costs of a -5 per cent target of \$67.78 million, based on the latest monthly carbon price used to value international carbon units, would be recorded as a fiscal risk in the Crown accounts
 5. agree to an unconditional responsibility target of 5 per cent below 1990 greenhouse gas emissions levels by 2020

6. note that in the short term it makes sense for New Zealand to follow the Kyoto framework of rules but in the longer term, alternative rules will need to be explored to better encourage participation by all countries
7. agree that New Zealand communicate an intention to apply, *mutatis mutandis*, the Kyoto Protocol's second commitment period framework of rules to its unconditional 2020 target including:
 - 7.1. a multi-year carbon budget (the approach used to express our commitment period one target);
 - 7.2. international reporting of our emissions and removals to maintain the integrity and transparency of New Zealand's actions; and
 - 7.3. measuring our progress against a 2020 target as if we had made a commitment under the Kyoto Protocol, including recognition of our over-achievement from commitment period one (2008 - 2012)
8. authorise the Minister for Climate Change Issues to announce New Zealand's unconditional 2020 target following a Cabinet decision

9.

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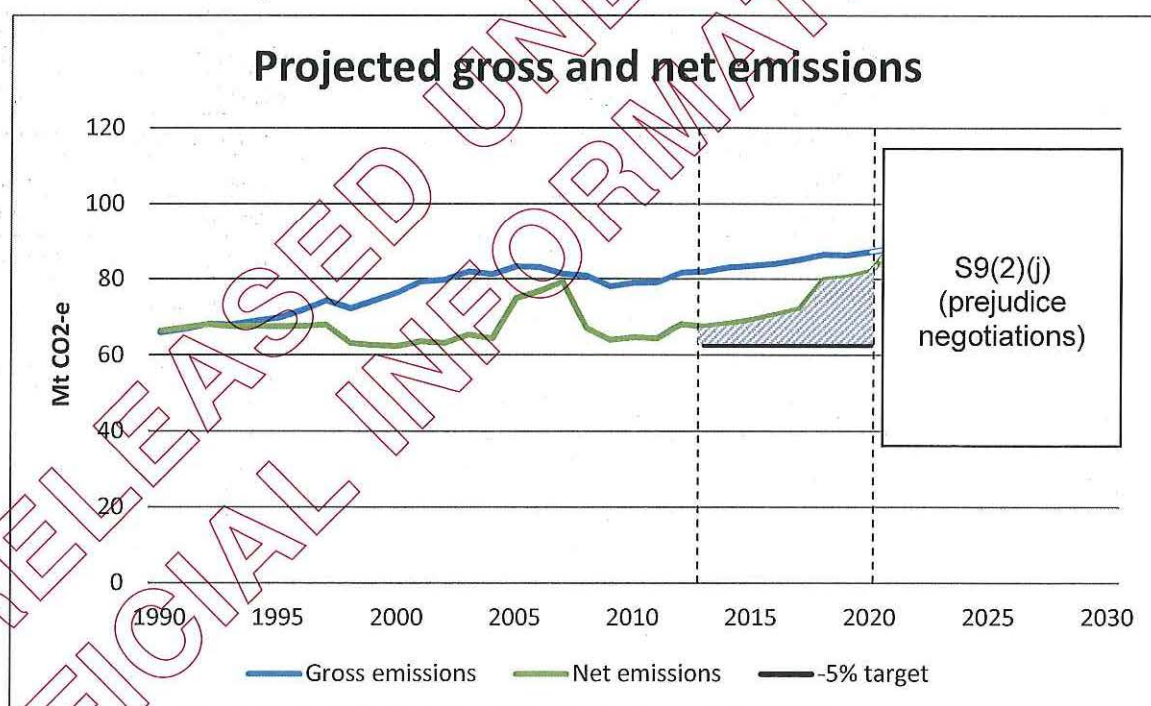
10. note that in maintaining New Zealand's conditional 2020 target range the Government remains prepared to take on further targets, should our conditions be met

Hon Tim Groser
Minister for Climate Change Issues

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Appendix 1 – Target methodology, fiscal cost and projected emissions

1. New Zealand's unconditional 2020 target will take the form of a multi-year 'carbon budget', which will entail taking responsibility for our emissions over an eight year period (2013 - 2020 inclusive). A carbon budget approach is in line with developed countries such as the EU-28 member states, Australia and Norway. The alternative, accounting for only a single 'end point' year, would be difficult to reconcile with carbon markets, multi-year forestry activity and the use of international units. Emissions Trading Scheme (ETS) participants might also question why they face costs for each year during 2013 - 2019 when the Government does not.
2. The Government will be required to cancel international emissions units equal to the difference between New Zealand's target and actual greenhouse gas emissions. A more ambitious target will require a greater number of units to be cancelled. Each percentage point difference in a target corresponds to approximately three million units. In the graph below, this is demonstrated by the shaded area between a -5% target for 2013 - 2020 and New Zealand's net emissions for the period:



3. These projections are based on a number of assumptions including a carbon price of between \$0 and \$12, and the use of 'AR4' global warming potentials to calculate the carbon dioxide equivalent of different greenhouse gases. Current Kyoto Protocol forestry accounting rules have been applied to emissions after 2020. The future accounting framework has not yet been agreed, and emissions may therefore differ significantly to those indicated after 2020. More detail is provided in paragraphs 18 - 22.

Carrying over international units

4. Emissions reductions targets under the Kyoto Protocol (KP) are made within 'commitment periods' of internationally agreed lengths of time. Commitment period one (CP1) was five years long (2008 - 2012 inclusive) and commitment period two (CP2) will be eight years long (2013 - 2020 inclusive).
5. Countries that have set an emissions reduction target under the KP may use international carbon units to meet their commitment. However a situation may arise where a country purchases or is allocated more units than it requires to meet its target. In this case, the CP1 KP rules permitted countries to 'bank' some of these emissions units, for use in subsequent commitment periods.
6. New Zealand successfully achieved its KP target under CP1. At the end of 2012, however, Government had more units than it requires to meet this target. Because the majority of these units come from forestry planting activity between 2008 and 2012, international rules would allow New Zealand to retain possession of its excess units to help meet a target under the KP.

7.

Withheld under S9(2)(j) (negotiations without prejudice or disadvantage)

Any Kyoto units that remain in the New Zealand Emission Unit Register after the 'true-up period' (which we anticipate will be completed in mid-2015) will be subject to mandatory cancellation if not carried over.

8. Restricting unit carryover in some circumstances is important to protect the integrity of international carbon markets. For example, if a country was able to retain its CP1 units but did not take a firm emissions reduction target in CP2, the country would be able to both increase its emissions and sell units overseas, effectively 'double-counting' permits to emit.
9. As noted in this paper, New Zealand will take a firm, unconditional target for 2013 - 2020. The Government plans to use its CP1 units to meet its next emissions reduction target, as permitted for countries taking a CP2 target under the KP.
10. This paper therefore proposes that New Zealand measure its progress against a 2020 target as if we had made a commitment under the Kyoto Protocol, including carrying over our surplus CP1 units.

11.

Withheld under S9(2)(j) (negotiations without prejudice or disadvantage)

Withheld under section 9(2)(f)(iv) of the OIA, to protect the confidentiality of advice tendered officials

Emissions rules to be applied to New Zealand's target

12. New Zealand will measure progress against its 2020 target as if we had made a commitment under the Kyoto Protocol, i.e. using the Kyoto framework of rules and emissions reporting.

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13. New Zealand will include the forestry rules as negotiated to apply to the second Kyoto Commitment Period. These include several new rules that are of benefit to New Zealand, but exclude the Afforestation Reforestation Debit Credit rule, which applied to New Zealand's 2008 - 12 target.

Withheld under S9(2)(j) (negotiations without prejudice or disadvantage)

14. Applying a Kyoto framework of rules will ensure New Zealand maintains transparency in taking a Convention track approach and retains the key structural achievements of the Kyoto Protocol to date. It does not change New Zealand's principled negotiating position that a future climate change agreement must more effectively provide for planted forests in order to secure broad participation. The rules applied to our 2020 emissions target do not impact on the rules legislated within New Zealand's emissions trading scheme, including the Afforestation Reforestation Debit Credit Rule.

The fiscal cost of a target

15. Cancelling international units to meet a target involves writing off an asset in the Crown accounts, creating a fiscal cost. Government currently possesses a surplus of 29 million international units.¹³

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¹³ I.e. the most recently published projection of New Zealand's net position under the first commitment period of the Kyoto Protocol, based on a financial statement ending in May 2013.

2020 Target on 1990 levels	Units required to meet target (million)		Total fiscal cost at current price of \$0.87 (\$m)
0% (CP1 target)	50 to 63	S9(2)(f)(iv), S9(2)(j) and S9(2)(k) (advice, negotiations and advantage)	\$54.81
-5%	64 to 78		\$67.78
-10% (low end of conditional range)	79 to 92		\$80.74
-15%	94 to 107		\$93.71
-20% (high end of conditional range)	109 to 122		\$106.68

19. The cost of writing off international units to meet an unconditional 2020 target will be recorded in Crown accounts as a fiscal risk. The Crown's fiscal position would only be affected when the processes for writing off units are formally established.

The value of international units 2013 - 2020

20. The value of this fiscal risk is based on the valuation of international emissions units in the Crown accounts. These units are currently valued at \$0.87 NZD each, but this will change over time. Officials do not anticipate any significant upward pressures on international carbon prices between now and 2015. Most market analysts forecast that prices will stay below NZ\$2 for this period. The table below demonstrates the costs of meeting different targets based on a series of possible scenarios:

	July average	3 month average	1 year average
Spot price per international unit (\$NZ)	\$0.87	\$0.73	\$1.37
Fiscal risk of a -5% target (\$m)	\$56 - \$68	\$47 - \$57	\$88 - \$107

Projections of New Zealand's emissions

21. New Zealand's net emissions are projected to be between 550 and 590 mega-tonnes of carbon dioxide equivalent over the 2013 to 2020 period.

22. This range of figures reflects the uncertainty inherent in emissions forecasts. New Zealand's emissions will be influenced by a number of factors including the domestic price of carbon, forestry land owner behaviour, growth in GDP and oil prices.

23. Sources of emissions such as waste and synthetic gases reflect different Statistics New Zealand population growth projections, and different growth rates in the quantum of industrial processes performed by New Zealand businesses.
24. Projections of New Zealand's forestry activity will always involve a particular degree of uncertainty because they rely on assessments of forest harvest, afforestation and deforestation decisions out into the future. In calculating affordability, a pessimistic scenario for forest harvest and deforestation was used to provide a conservative estimate of the level of carbon sequestration credits that would be available at the end of 2020. While this scenario presents the higher end of potential emissions, it is based on current carbon prices and stated intentions to deforest.

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Appendix 2 – Defining New Zealand’s fair share

1. A target for New Zealand can be compared to the actions of other countries in a number of ways. Different measurement tools or ‘metrics’ will provide different assessments of the ambition a target represents. For example New Zealand is generally estimated to have high emissions intensity (emissions divided by output); above that of Canada, the EU-28, Japan and the United States. Conversely the structure of our economy means that it is more difficult for New Zealand to reduce its emissions than it is for most other developed countries. Metrics based on ‘equal cost’ suggest that even a modest New Zealand target represents a relatively high level of climate change ambition.

Comparability information

2. A number of assessments will inform the overall picture of New Zealand’s ‘fair share’, in conjunction with current climate change negotiations. A small number of these metrics are presented overleaf, and a more detailed overview of country characteristics is set out on page 18.
3. This comparability information is sourced from publicly available international data, including an international abatement cost calculator and world emissions database.
4. The “Comparative mitigation cost of target” column on page 5 reflects the cost of both international purchasing and domestic mitigation costs. Cross-country analyses require a nuanced comparison of the information presented to ensure a consistent approach. Such estimates are also very sensitive to assumptions about different economies and the ease with which countries can curb domestic emissions. For example, the cost calculator assumes a carbon price of €15.00, and that the United States could *increase* its GDP by performing domestic abatement in its energy sector.
5. Cost figures are therefore a useful indicator of the relative costs of each country meeting its target. Figures are not likely to be accurate indications of the absolute GDP impacts of targets on different countries.

Implied targets

6. A number of international experts have calculated the 2020 targets implied for different countries by different measurement tools.
7. An example from the Netherlands Environmental Protection Agency is summarised below. The 2020 target implied for Oceania (i.e. New Zealand and Australia) varies between +19% (based on an 'equal cost' approach) and -14% (based on converging per capita emissions).

Table 4.4 Reduction targets (%) compared to 1990 levels, by 2020, for the '20% Annex I comparable' scenario. The red cells indicate the approach using the highest reduction per country and the green cells indicate those countries with the lowest reductions.

Regions	2010 reduction target*	Equal reduction baseline	Equal MAC	Equal costs (excl. IET & CDM)	Equal costs (incl. IET & CDM)	Converging per capita emissions	Triptych
Canada	-6	-7	-19	-15	-14	-23	-15
USA	26	0	0	1	1	-2	0
EU	-8	-27	-26	-30	-31	-22	-25
Russian Federation	-28	-43	-45	-40	-40	-42	-46
Japan	-6	-9	0	-8	-11	-18	-8
Oceania	7	15	17	18	19	-14	6
Ukraine region	-40	-61	-59	-56	-56	-50	-54
Annex I	-1.5	-20	-20	-20	-20	-20	-20

*: For 2010 we assume that all Annex I countries (except the USA) reach the minimum of their Kyoto target or their reference emission levels, by 2010 (see Section 4.1.1).

	Projected % Global Emissions (2020)	Emissions Intensity (2005 Gg CO ₂ -e / \$ billion PPP)	Emissions per Capita (2005 Gg CO ₂ -e / 1000 people)	Emissions Consumption per Capita (2001 Gg CO ₂ -e / 1000 people)	% Emissions from agriculture (2005)	% Renewable Electricity Production (2009)	Lower end 2020 pledge relative to 1990 levels	Comparative mitigation cost of target in 2020 (% of GDP)
Australia	1.05%	845	27.5	20.6	20%	7%	-4%	0.06 – 0.13%
Canada	1.35%	655	23	19.6	10%	77%	4%	-
European Union (27)	9.23%	374	10.1	15.4	12%	46%	-20%	-
Japan	2.39%	347	10.7	13.8	3%	37%	-25%	0.04%
New Zealand	0.15%	728	18.4	11.4	50%	72%	-5%	0.19% (if -5% target)
Norway	0.09%	233	11.1	14.9	9%	97%	-30%	0.15%
Russian Federation	4.46%	1143	13.5	10.1	6%	34%	-15%	-
United States	13.00%	549	23.2	28.6	6%	31%	-3%	0.00%
Brazil	4.48%	639	5.4	4.1	58%	92%	-36% on BAU	Available analysis does not extend beyond 'Annex 1' (a subset of industrialised countries)
China	24.13%	2876	5.5	3.1	15%	19%	-40% intensity on 2005	
India	5.60%	348	1.6	1.8	22%	16%	-20% intensity on 2005	
Korea, Republic of	1.22%	518	12.1	9.2	3%	34%	-30% on BAU	
Mexico	1.41%	486	5.9	5.6	12%	18%	51Mt reduction in	
Singapore	0.11%	258	11.7	24.1	0%	0%	-16% on BAU	
South Africa	1.09%	1042	8.8	6	10%	6%	-34% on BAU	