Ministry for the Environment
Manatū Mō Te Taiao

New Zealand's Initial Report

New Zealand's Report to facilitate the calculation of its emissions budget for the period 2013 to 2020

New Zealand Government

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Contents

Tables

Figures

Introduction

New Zealand's 2020 target

For the period 2013 to 2020, New Zealand has set an unconditional target under the United Nations Framework Convention on Climate Change (UNFCCC) to reduce emissions to 5 per cent below 1990 levels by 2020. This report describes how New Zealand will account for its target and present its emissions budget for the period 2013 to 2020 to enhance the transparency of New Zealand's approach to measuring progress towards its unconditional 2020 target.

The eighth session of the Conference of the Parties, serving as the meeting of the Parties to the Kyoto Protocol (CMP.8 held in Doha, Qatar, November to December 2012), agreed to amendments to the Kyoto Protocol for the period 2013 to 2020, including an amended Annex B.[1] New Zealand does not have a commitment listed in the amended Annex B of the Kyoto Protocol, but has taken an unconditional emission reduction target under the UNFCCC for the period 2013 to 2020, to reduce emissions to 5 per cent below 1990 levels by 2020. This is equivalent to an annual average of 96.8 per cent of New Zealand's aggregate anthropogenic (human made) emissions of the greenhouse gases listed in Annex A of the Kyoto Protocol reported in the base year (1990), expressed as carbon dioxide equivalents over the period 2013 to 2020.

Establishing New Zealand's emissions budget for the period 2013 to 2020

New Zealand accepted the Doha Amendment to the Kyoto Protocol on 30 November 2015, remains a Party to the Kyoto Protocol, and applies the Kyoto Protocol framework of rules in reporting progress against its emissions reduction target for the period 2013 to 2020. New Zealand will continue to implement reporting requirements consistent with the decisions of the Kyoto Protocol Doha Amendment[2] that established the second commitment period (CP2) under the Kyoto Protocol.

Parties that took a commitment for CP2 of the Kyoto Protocol must submit an Initial Report to the UNFCCC secretariat to facilitate the calculation of their Assignment Amount for CP2. As New Zealand did not take a commitment under the Kyoto Protocol for the period 2013 to 2020, the Initial Report is not a mandatory reporting requirement for New Zealand. Nevertheless, in staying consistent with the Kyoto Protocol framework of rules, New Zealand has prepared an Initial Report to establish its emissions budget for the period 2013 to 2020.

Review of New Zealand's 1990 base year

Following the Doha Amendment and according to the conclusions of the Subsidiary Body for Scientific and Technological Advice (SBSTA) contained in document FCCC/SBSTA/2014/5 (UNFCCC, 2015, paragraph 84), Annex B Parties that did not take a quantified emission limitation and reduction commitment (QELRC) under the Kyoto Protocol, including New Zealand, 'may request the expert review team (ERT) to review, as part of the review by the ERT of that Party's annual inventory

[1] These amendments are contained in Decision 1/CMP.8.

[2] UNFCCC. 2013. *Report of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on its eighth session, held in Doha from 26 November to 8 December 2012: Addendum – Part 2: Action taken by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol at its eighth session*. FCCC/KP/CMP/2012/13/Add.2.

for the first year of CP2, information relating to that Party's base year.' The SBSTA recommended that such a request should be carried out as part of the annual review for the first year of CP2. 2016 is the first year of CP2 when greenhouse gas inventories submitted under the Kyoto Protocol will be reviewed by international ERTs.

Due to technical issues with the UNFCCC Common Reporting Format (CRF) software and tables, New Zealand was unable to submit its inventory under the Kyoto Protocol in 2015. New Zealand's first full inventory submission under the Kyoto Protocol was submitted on 20 May 2016. New Zealand has used *New Zealand's Greenhouse Gas Inventory Report 1990–2014* and the associated CRF tables submitted on 20 May 2016 as the basis for all calculations in this report, in particular the estimate for the 1990 base year used to calculate New Zealand's emissions budget.

Should New Zealand submit revised inventory data if requested by the ERT during the review process, this report will be updated.

The structure of the report follows the requirements outlined in decision 2/CMP.8 for initial reports (UNFCCC, 2013).

Greenhouse gas inventory for the period 1990 to 2014

New Zealand's latest completed inventory – *New Zealand's Greenhouse Gas Inventory 1990-2014* – and the associated CRF tables have been submitted to the UNFCCC secretariat (Ministry for the Environment, 2016).

The methodologies used in the preparation of New Zealand's greenhouse gas inventory are consistent with the *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, and the *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. Table 1 provides summary data on New Zealand's greenhouse gas (GHG) emissions by sector (all emissions are expressed in kilotonnes (kt) carbon dioxide equivalent (CO_2-e)).

Table 1: New Zealand's GHG emissions by sector

Greenhouse Gas Source And Sink Categories	1990	1995	2000	2005	2010	2011	2012	2013	2014
	kt CO_2 equivalent								
1. Energy	23,793	25,905	30,020	34,598	32,198	31,321	32,430	31,853	32,240
2. Industrial processes and product use	3,579	3,202	3,458	4,112	4,654	4,931	4,921	5,051	5,194
3. Agriculture	34,351	36,162	38,306	40,267	37,713	38,426	39,348	39,279	39,585
4. Land use, land-use change and forestry (LULUCF)	-28,928	-28,399	-30,438	-28,495	-29,266	-28,191	-25,966	-25,040	-24,415
5. Waste	4,105	4,372	4,600	4,689	4,376	4,263	4,192	4,116	4,085
Gross (without LULUCF)	**65,828**	**69,641**	**76,385**	**83,666**	**78,942**	**78,942**	**80,890**	**80,298**	**81,104**
Net (with LULUCF)	**36,901**	**41,243**	**45,947**	**55,171**	**49,676**	**50,750**	**54,925**	**55,258**	**56,690**

Note: *all emission estimates are rounded to the nearest kt CO_2 equivalent*

Base year for nitrogen trifluoride

Emissions of nitrogen trifluoride are not applicable to New Zealand because the industries that could be potential sources of the gas do not exist in the country. However, New Zealand has selected 1990 as the base year for nitrogen trifluoride, which is consistent with the base year for all gases included in the national GHG inventory.

Agreement under Article 4 of the Kyoto Protocol

New Zealand will not be a participant in any Article 4 agreements.

Calculation of New Zealand's emissions budget

New Zealand has calculated its emissions budget by applying the UNFCCC technical guidance (UNFCCC, 2011).

As the greenhouse gas emissions from land use, land-use change and forestry (LULUCF) did not constitute a net source in 1990, New Zealand's calculation of its emissions budget is based on New Zealand's gross emissions (table 1).

New Zealand has taken a quantified economy-wide emission reduction target under the UNFCCC in the period 2013 to 2020 to reduce emissions to 5 per cent below 1990 levels by 2020.

The UNFCCC technical paper FCCC/TP/2010/3/Rev.1 (UNFCCC, 2011) recommends the use of a 'trajectory' to calculate average annual emissions reductions required to meet targets, beginning from a Party's previous target. This methodology was used to calculate New Zealand's emissions budget. The budget is equivalent to 96.8 per cent of aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases listed in Annex A of the Kyoto Protocol, reported in the base year (1990) of New Zealand's greenhouse gas inventory for the period 1990 to 2014 and multiplied by eight (number of years included in the period). Detailed information on the methodology applied is contained in Annex 1.

Based on the gross emissions data for 1990 included in New Zealand's 2016 inventory submission, New Zealand's emission budget for the period 2013 to 2020 is 509,774,982 t CO_2-e. Table 2 provides details of this calculation.

Table 2: Calculation of New Zealand's emissions budget

Sector	Emissions (t CO_2-e)
Energy	23,793,170
Industrial Processes and Product Use	3,578,866
Agriculture	34,351,100
Waste	4,105,245
Gross base year (1990) emissions	65,828,381
Gross base year (1990) emissions times 8	526,627,048
New Zealand's emissions budget (8 times 96.8% of base year estimates)	**509,774,982**

***Note**: all estimates are rounded to the nearest tonne*

Application of Article 3.7 ter

This does not apply to New Zealand because New Zealand does not have an entry in the third column of Annex B to the Kyoto Protocol, and as such does not have Assigned Amount Units (AAUs) in CP2.

Calculation of the commitment period reserve

This does not apply to New Zealand because New Zealand does not have an entry in the third column of Annex B to the Kyoto Protocol.

Identification of selected values for tree crown cover, land area and tree height for use in accounting for activities under Article 3, paragraphs 3 and 4

New Zealand uses the same forest definition for the period to 2020 as that used for the first commitment period (CP1) and as defined in *New Zealand's Initial Report under the Kyoto Protocol* (Ministry for the Environment, 2006). This definition is consistent with that used for the LULUCF sector under the UNFCCC reporting. Table 3 describes the forest parameters used in New Zealand and provides the single minimum values New Zealand uses in accounting for its LULUCF activities under Article 3.3 and Article 3.4.

Table 3: Parameters defining forest in New Zealand

Forest parameter	Kyoto Protocol range	New Zealand selected value
Minimum land area (ha)	0.05–1	**1**
Minimum crown cover (%)	10–30	**30**
Minimum height (m)	2–5	**5**

Election of activities under Article 3.4 in the period 2013–2020

New Zealand accounted for the mandatory Article 3.3 activities *Deforestation* and *Afforestation/Reforestation* in CP1 of the Kyoto Protocol.

In accounting for its target under the UNFCCC for the period 2013 to 2020, New Zealand will continue accounting for *Deforestation* and *Afforestation/Reforestation* as well as the Article 3.4 activity, *Forest management*, which is mandatory under the Kyoto Protocol for CP2. New Zealand has not elected to account for the voluntary activities under Article 3.4 of the Kyoto Protocol for the period 2013 to 2020. This is consistent with New Zealand's reporting for CP1. Chapters 6 and 11 of *New Zealand's Greenhouse Gas Inventory 1990-2014* describe how New Zealand's national system will identify land areas associated with all Article 3.3 and Article 3.4 activities and how land accounted for under Article 3.3 activities in CP1 continue to be accounted for in the period 2013 to 2020.

Accounting for Article 3.3 and Article 3.4 activities

New Zealand intends to account for each activity under Article 3, paragraph 3 and for *Forest management* under Article 3, paragraph 4 of the Kyoto Protocol for the entire period 2013 to 2020, (i.e. end of period accounting).

Forest management reference level and technical corrections

New Zealand has chosen to account for *Forest management* against a projected business-as-usual forest management reference level (FMRL) as inscribed in the appendix to the annex to Decision 2/CMP.7 (UNFCCC, 2012).

For the 2016 inventory submission New Zealand has implemented the recommendations from the technical assessment report (UNFCCC Secretariat, 2011, pp 9–10) to achieve consistency between the FMRL with the data used for reporting against it. This involves corrections to:

- planted forest areas and harvesting data so the $FMRL_{corr}$ covers the same area as included in New Zealand's *Forest management* definition
- address new guidance for calculating emissions for carbon equivalent forests
- allow for overplanting (these emissions were not included in New Zealand's 2011 FMRL but are included in *Forest management* reporting)
- include non-CO_2 greenhouse gas emissions (these were not included in New Zealand's 2011 FMRL but are included in *Forest management* reporting)
- include emissions and removals from natural forests
- incorporate the new reporting requirements for *Harvested wood products*

- provide more disaggregated data to increase the transparency of the FMRL.

All changes that have been made follow the guidance provided in the annex to Decision 2/CMP.7 (UNFCCC, 2012) and Kyoto Protocol Supplement (sections 2.7.5.2 and 2.7.6, IPCC, 2014).

A summary of the technical corrections (calculated as annual average emissions) is presented in table 4. For further details on New Zealand's FMRL refer to the *New Zealand's Greenhouse Gas Inventory 1990-2014* (section 11.3.4 and Annex 5.1).

Table 4: Summary of the technical corrections to the FMRL

	Emissions (Mt CO_2-e)
Forest Management Reference Level (FMRL)	**11.15**
Technical corrections	
To achieve consistency with the methods used in 2013 Inventory:	4.33
Incorporation of additional pools and sources	
Including natural forest:	–6.08
Incorporating harvested wood products:	–4.36
Incorporating non-CO_2 greenhouse gas emissions:	–0.013
Total of technical corrections	**–17.26**
$FMRL_{corr}$	**–6.10**

Forest management cap

For the period 2013 to 2020, the forest management cap is set at 3.5 per cent of a country's base year gross emissions multiplied by the number of years in the period (table 5).

Table 5: New Zealand's forest management cap calculation

Calculation step	Emissions (t CO2-e)
1990 gross emissions estimate (excluding LULUCF) from latest completed GHG inventory (covering 1990-2014 time series)	65,828,381
Forest management cap: 3.5 per cent of 1990 gross emissions times 8	**18,431,947**

Information on harvested wood products emission calculation

The *Harvested wood products* category is made up of all wood material that leaves a harvest site and is subsequently processed. This wood constitutes a carbon reservoir (section 12.1, IPCC, 2006).

New Zealand accounts for changes in harvested wood products for *Afforestation and reforestation* and *Forest management* by applying tier 2 default methods provided by the IPCC (2014), supplemented with country specific activity data and parameters where available. Harvested wood products originating from *Deforestation* events are accounted for on the basis of instant oxidation.

Harvested wood product emissions for 2014 for *Afforestation and reforestation* were –50 kt CO_2-e, for *Forest management* they were –4,822.1 kt CO_2-e. For further details on the *Harvested wood products* category refer to the *New Zealand's Greenhouse Gas Inventory 1990-2014 (*sections 11.3.6, 11.4.1, 11.4.3 and A5.1.2.5)

Natural disturbances

In the event of a significant natural disturbance, New Zealand intends to exclude emissions due to natural disturbances from the accounting for *Afforestation and reforestation* and *Forest management* following Decision 2/CMP.7 (annex I, paragraphs 33 and 34, UNFCCC, 2012).

Types of natural disturbances New Zealand intends to exclude from the accounting are:

- wildfires
- invertebrate and vertebrate pests and diseases
- extreme weather events
- geological disturbances.

In all cases except fire, New Zealand assumes a zero baseline between 1990 and 2009. While other natural disturbance events occurred throughout the calibration period, assumptions were made for the purposes of calculating the background level.

For planted forests accounted for under *Afforestation and reforestation* and *Forest management*, salvage logging is considered to take place in all disturbed forests.

Information on how New Zealand has calculated the background level for natural disturbance is included in the *New Zealand's Greenhouse Gas Inventory 1990-2014* (Annex 5.2).

Annex 1 – calculation of the average annual emissions using a 'trajectory' method

New Zealand's 2013 to 2020 emissions budget is based on a target of a 5 per cent reduction on 1990 levels by 2020. UNFCCC technical paper FCCC/TP/2010/3/Rev.1 recommends the use of a 'trajectory' to calculate average emissions.

As per the UNFCCC technical paper (UNFCCC 2011), New Zealand has used a linear trajectory starting at the mid-year of CP1 (2010). The starting point of the trajectory corresponds to the CP1 QELRC (100 per cent, black bar in figure A1). The end-point of the trajectory is at the unconditional target of 95 per cent in the year 2020. Figure A1 shows the trajectory between 2010 and 2020 as the dotted line. The mathematical equation for the annual emission levels portrayed by the dotted line is

Annual emission level (%) = 100(%) – 0.5(%)*(year – 2010) (equation A1)

New Zealand's emissions budget for the period 2013 to 2020 (the QELRC) is calculated as the average of the trajectory over the period 2013 to 2020, which equates to 96.8 per cent on 1990 levels. Table A1 provides an illustration for the calculation using percentages and actual emission values from *New Zealand's Greenhouse Gas Inventory 1990-2014*.

The emissions budget is calculated as

Emissions budget (t CO_2 eq) = QELRC (%) * base year emissions (t) * number of years in commitment period (equation A2)

Figure A1: Application of the 'trajectory' method for New Zealand's emissions budget calculation

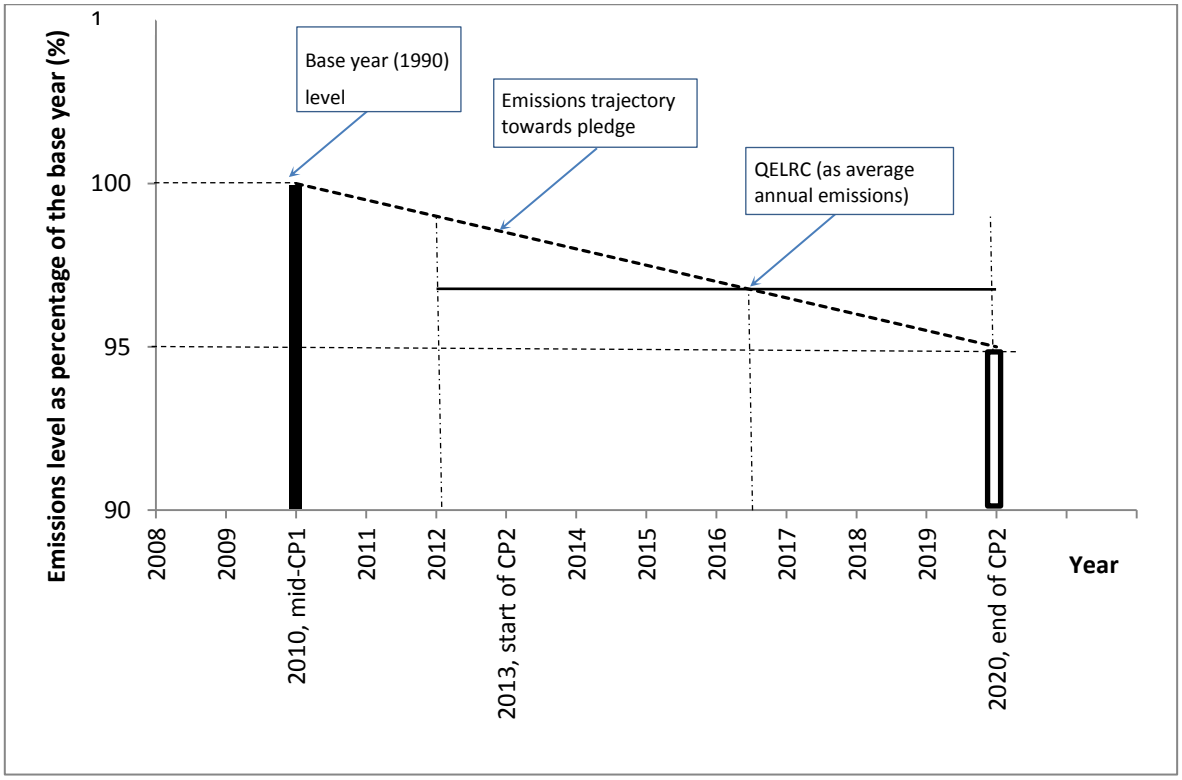

Table A1: Application of 'trajectory' method for New Zealand's emissions budget calculation

Calculation item	**Calculated value**
Base year (1990) level – this is the starting point of the trajectory in 2010	65,828,381(t CO_2-e) or 100 %
Yearly emissions level as percentage of the base year level (as per equation A1) in 2010-2020 (the years included in averaging are in bold):	
2010	100.0 %
2011	99.5 %
2012	99.0 %
2013	**98.5 %**
2014	**98.0 %**
2015	**97.5 %**
2016	**97.0 %**
2017	**96.5 %**
2018	**96.0 %**
2019	**95.5 %**
2020	**95.0 %**
Average trajectory height between in 2013-2020	96.8 %
New Zealand's base year level (1990) times 8 (t CO2-e)	526,627,048
New Zealand's emissions budget for 2013-2020 (based on 96.8% annual average)	**509,774,982**

***Note**: all estimates are rounded to the nearest tonne; all percentages are rounded to the nearest decimal place.*

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