Ministry for the Environment
Manatū Mō Te Taiao

New Zealand's Third Biennial Report

Under the United Nations Framework Convention on Climate Change

New Zealand Government

Acknowledgements

Ministry for the Environment thanks the following government agencies for their contribution to the production of New Zealand's Seventh National Communication and the Third Biennial Report:

Energy Efficiency and Conservation Authority, Ministry for Business, Innovation and Employment, Ministry of Education, Environmental Protection Authority, Ministry for Foreign Affairs and Trade, Ministry for Primary Industries, Ministry of Transport, and Statistics New Zealand.

Ministry for the Environment

» Charles Rands (Project Leader National Communication and Biennial Report)

» Olia Glade (Chapter I: Information on greenhouse gas emissions and trends)

» Ted Jamieson and Josh Bibby (Chapter II: Quantified economy-wide emission reduction targets, Chapter III: Progress in achievement of quantified economy-wide emission reduction targets and relevant information)

» James Fick (Chapter IV: Projections)

Ministry of Foreign Affairs and Trade

» Amy Tisdall, Kiri Stevens, Andrea Stewart, Jonathan Martin, Bruce Inglis (Chapter V: Provision of financial, technological and capacity building support to developing countries)

This document may be cited as:
Ministry for the Environment. 2017. New Zealand's Third Biennial Report Under the United Nations Framework Convention on Climate Change Wellington: Ministry for the Environment.

Published in December 2017 by the
Ministry for the Environment
Manatū Mō Te Taiao
PO Box 10362, Wellington 6143, New Zealand

ISBN: 978-1-98-852532-7 (print)
978-1-98-852531-0 (online)

Publication number: ME 1339

This document is available on the Ministry for the Environment website: **www.mfe.govt.nz**.

Ministry for the Environment
Manatū Mō Te Taiao

Making Aotearoa New Zealand the most liveable place in the world
Aotearoa – he whenua mana kura mō te tangata

Contents

Tables

Figures

Common tabular format tables

For CTF Table 1 refer to Annex A

Abbreviations

AAUs	assigned amount units
ADB	Asian Development Bank
ADPC	Asia Disaster Preparedness Centre
APEC	Asia–Pacific Economic Cooperation
ASEAN	Association of South East Asian Nations
BERG	Biological Emissions Reference Group
C	carbon
CBIT	Capacity Building Initiative for Transparency
CCAC	Climate and Clean Air Coalition
CERs	certified emission reductions
CEF-ne	newly established forest
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2-e	carbon dioxide equivalent
CP1	first commitment period
COP	Conference of the Parties
CRF	common reporting format
CTF	common tabular format
DAC	Development Assistance Committee (OECD)
DAC	developing evaluation capacity
E3 Programme	Equipment Energy Efficiency Programme
EECA	Energy Efficiency and Conservation Authority
EPA	Environmental Protection Authority
ERUs	emission reduction units
EU	European Union
FRDP	Framework for Resilient Development in the Pacific 2017–2030
F-gases	hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride
FMRL	forest management reference level
G20	Group of 20
GCF	Green Climate Fund
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GNS Science	Institute of Geological and Nuclear Sciences Limited
GRA	Global Research Alliance on Agricultural Greenhouse Gases
ha	hectares
HFCs	hydrofluorocarbons
IE	included elsewhere
INDC	Intended Nationally Determined Contribution
IPPU	industrial processes and product use
kg	kilogram
km	kilometre

kt	kilotonne
kt/yr	kilotonnes per year
kt CO_2-e	kilotonnes carbon dioxide equivalent
kW	kilowatt
kWp	kilowatt peak
lCERs	long-term certified emission reductions
LDCs	least developed countries
LEARN	Livestock Emissions Abatement Research Network
LULUCF	land use, land-use change and forestry
Mt CO_2-e	million tonnes carbon dioxide equivalent
MWh	megawatt hour
MWp	megawatt peak
N_2O	nitrous oxide
NA	not applicable
NDC	Nationally Determined Contribution
NE	not estimated
NF_3	nitrogen trifluoride
NIR	National Inventory Report
NMSs	National Meteorological Services
NMVOCs	non-methane volatile organic compounds
NO	not occurring
NO_X	oxides of nitrogen
NPS-FM	National Policy Statement for Freshwater Management
NZEECS	New Zealand Energy Efficiency and Conservation Strategy
NZ ETS	New Zealand Emissions Trading Scheme
ODA	official development assistance
ODS	ozone depleting substances
OECD	Organisation for Economic Co-operation and Development
PDR	People's Democratic Republic (Lao)
PFCs	perfluorocarbons
PJ	petajoule
QELRO	Quantified Emission Limitation or Reduction Objective
SF_6	sulphur hexafluoride
SDR	Special Drawing Rights
SEF	Standard Electronic Format
SIDS	small island developing states
SO_2	sulphur dioxide
SPREP	Secretariat of the Pacific Regional Environment Programme
TAPA	Technical Assistance for Pacific Access programme
tCERs	temporary certified emission reductions
t CO_2-e	tonnes carbon dioxide
UNICEF	United Nations Children's Fund
UNFCCC	United Nations Framework Convention on Climate Change
WFO–GRA	World Farmers' Organisation– Global Research Alliance on Agricultural Greenhouse Gases

Introduction

New Zealand is pleased to submit its Third Biennial Report under the United Nations Framework Convention on Climate Change. The report follows the biennial reporting guidelines for developed country Parties and comprises six chapters:

I. Information on greenhouse gas emissions and trends

II. Quantified economy-wide emission reduction targets

III. Progress in achievement of quantified economy-wide emission reduction targets

IV. Projections

V. Provision of financial, technological and capacity-building support to developing country Parties

VI. Other reporting matters.

The report also includes all of the relevant common tabular format tables contained in Conference of the Parties Decision 19/CP.18.

Chapter I: Information on greenhouse gas emissions and trends

Introduction

New Zealand's Greenhouse Gas Inventory (the inventory) is the official annual report of all anthropogenic (human-induced) emissions and removals of greenhouse gases in New Zealand. The inventory measures New Zealand's progress against obligations under the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol.

The reporting of emissions under the UNFCCC covers five sectors: energy; industrial processes and product use (IPPU); agriculture; land use, land-use change and forestry (LULUCF); and waste.

The inventory reports emissions and removals of the greenhouse gases carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs),[1] sulphur hexafluoride (SF_6) and nitrogen trifluoride (NF_3).[2] Only emissions and removals of these gases (direct greenhouse gases) are accounted for in total emissions under the UNFCCC and the Kyoto Protocol. Emissions of the indirect greenhouse gases, carbon monoxide (CO), sulphur dioxide (SO_2), oxides of nitrogen (NO_x) and non-methane volatile organic compounds (NMVOCs) are also included in the inventory but are not accounted for under the UNFCCC and the Kyoto Protocol.

New Zealand's most recent inventory report was submitted to the UNFCCC in May 2017. The submission was delayed by six weeks because several government agencies' activities were affected by the November 2016 Kaikōura earthquake. This caused several weeks' delay in inventory preparation and compilation and, in turn, resulted in delay of the inventory submission to the UNFCCC.

The inventory includes information on emissions and removals of greenhouse gases from 1990 to 2015, and supplementary information required for the Kyoto Protocol.[3]

National trends: emissions by sector and by gas

The information on greenhouse gas emissions presented in this report is the same as the information in the inventory[4] published in 2017.

---

1 Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) are referred to collectively as 'F-gases'.

2 Nitrogen trifluoride emissions do not occur in New Zealand.

3 The inventory submission is always delayed by about 15 months due to the time required for data collection and processing.

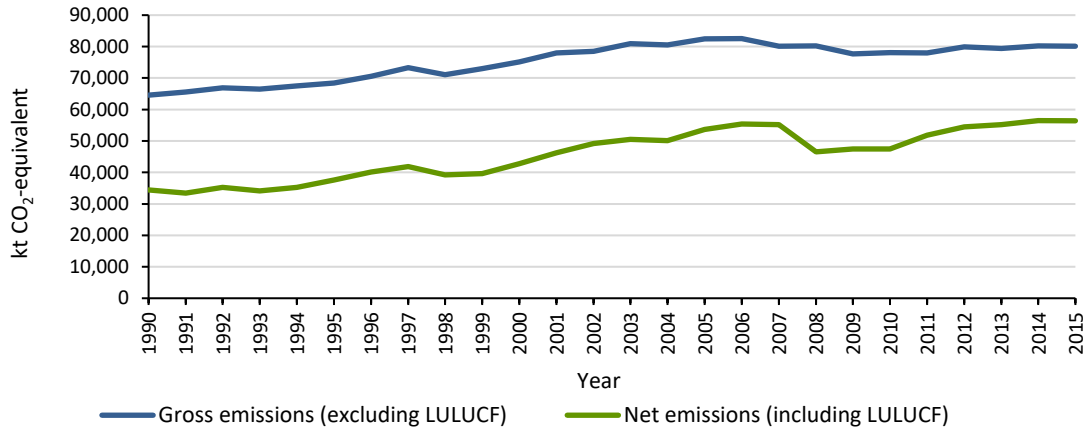
4 The inventory includes the National Inventory Report (NIR), the CRF tables (the CRF or the inventory database) and the Standard Electronic Format (SEF) tables (or the registry files). The NIR is used to refer to the National Inventory Report only (excluding the CRF and the SEF).

Gross emissions

As presented in the inventory submitted in 2017, New Zealand's total (gross) greenhouse gas emissions (excluding the LULUCF sector) were 80,155.1 kilotonnes of carbon dioxide equivalent (kt CO_2-e) in 2015. Between the base year (1990) and 2015, New Zealand's total emissions increased by 24.1 per cent. The average annual growth of emissions was approximately 0.9 per cent per year (figure 1.1).

The emission sources that contributed the most to the increase since 1990 were CH_4 emissions from dairy cattle,[5] CO_2 from road transport and manufacturing industries and construction (especially the categories chemicals and food processing, beverages and tobacco), N_2O from agricultural soils, and consumption of HFCs, PFCs and SF_6 from industrial and household refrigeration and air-conditioning systems.

Figure 1.1: New Zealand's gross and net emissions (under the UNFCCC) from 1990 to 2015



Note: kt CO_2-e = kilotonnes of carbon dioxide equivalent; LULUCF = land use, land-use change and forestry.

Source: Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015.* Wellington: Ministry for the Environment.

Net emissions

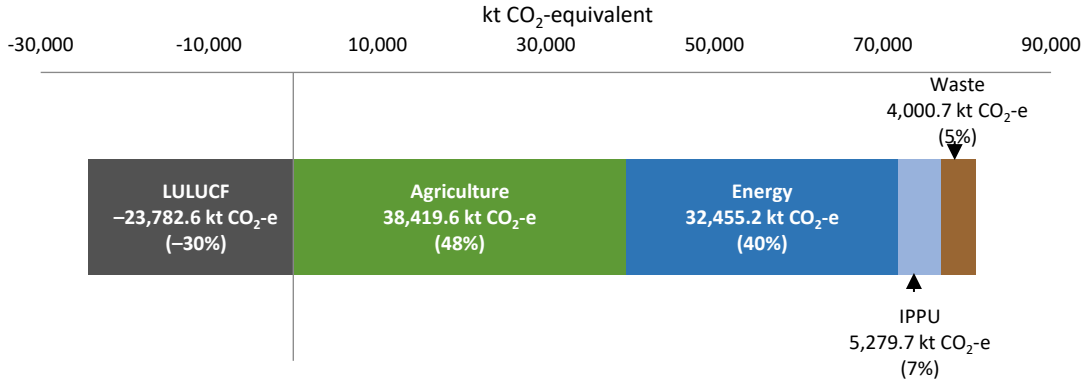
In 2015, New Zealand's net greenhouse gas emissions (including the LULUCF sector under UNFCCC reporting rules) were 56,372.5 kt CO_2-e. This represents an increase of 21,921.1 kt CO_2-e (63.6 per cent) since 1990 (figure 1.1). The reason for the increase is the combined effect of the increase in gross emissions and the higher harvesting rates in planted forests in 2015 compared with 1990.

Sector trends

The agriculture and energy sectors were the largest contributors to New Zealand's gross greenhouse gas emissions in 2015, contributing 47.9 per cent and 40.5 per cent of gross emissions respectively. The emissions associated with the IPPU sector and the waste sector were relatively minor, at 6.6 per cent and 5.0 per cent of gross emissions respectively. Removals from the LULUCF sector offset 29.7 per cent of New Zealand's gross emissions (figure 1.2) in 2015.

[5] Methane emissions produced from ruminant livestock.

Figure 1.2: New Zealand's greenhouse gas emissions by sector in 2015



Note: IPPU = industrial processes and product use; kt CO_2-e = kilotonnes of carbon dioxide equivalent; LULUCF = land use, land-use change and forestry.

Source: Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015.* Wellington: Ministry for the Environment.

Between 1990 and 2015, emissions from the energy, agriculture and IPPU sectors increased by 36.7 per cent, 16.0 per cent and 47.3 per cent above the 1990 level respectively, while emissions from the waste sector decreased by 2.9 per cent below the 1990 (base year) level, staying under the base year level for three years in a row (table 1.1).

Table 1.1: New Zealand's emissions of greenhouse gases by sector in 1990 and 2015

Sector	kt CO_2-equivalent 1990	2015	Change from 1990 (kt CO_2-equivalent)	Change from 1990 (%)
Energy	23,748.5	32,455.2	8,706.7	36.7
Industrial processes and product use	3,584.4	5,279.7	1,695.3	47.3
Agriculture	33,122.9	38,419.6	5,296.7	16.0
Waste	4,118.0	4,000.7	–117.4	–2.9
Gross (excluding LULUCF)	**64,573.8**	**80,155.1**	**15,581.3**	**24.1**
LULUCF	–30,122.4	–23,782.6	6,339.8	21.0
Net (including LULUCF)	**34,451.4**	**56,372.5**	**21,921.1**	**63.6**

Note: Net removals from the land use, land-use change and forestry (LULUCF) sector are as reported under the UNFCCC (see chapter 6 of the *New Zealand Greenhouse Gas Inventory*). Columns may not total due to rounding. Percentages presented are calculated from unrounded values. kt CO_2 = kilotonnes carbon dioxide.

Source: Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015*. Wellington: Ministry for the Environment.

The growth in energy sector emissions is primarily from road transportation, manufacturing industries and construction (mostly food processing, beverages and tobacco, and chemicals) and public electricity and heat production.

The main drivers for the emissions growth in the agriculture sector are an increase of 88.5 per cent in the size of the national dairy herd since 1990 and an approximately 600 per cent increase in nitrogen-containing synthetic fertiliser applied over this time. Over the same period, there was a decrease of 49.7 per cent in the sheep flock and 22.8 per cent in non-dairy cattle population, which partially offsets these increases.

The increase of emissions from the IPPU sector was mainly driven by increasing emissions from products used as substitutes for ozone depleting substances (ODS), due to the introduction of HFCs to replace ODS in refrigeration and air conditioning, and the increased use of household and commercial air conditioning. Carbon dioxide emissions have also increased due to increased production of cement, metals and ammonia but at a slower rate. There has been a substantial reduction in emissions of PFCs due to improved management of anode effects in aluminium production.

The emission reductions in the waste sector occurred in the solid waste disposal on land category as a result of initiatives to improve solid waste management practices and the recovery of landfill gas.

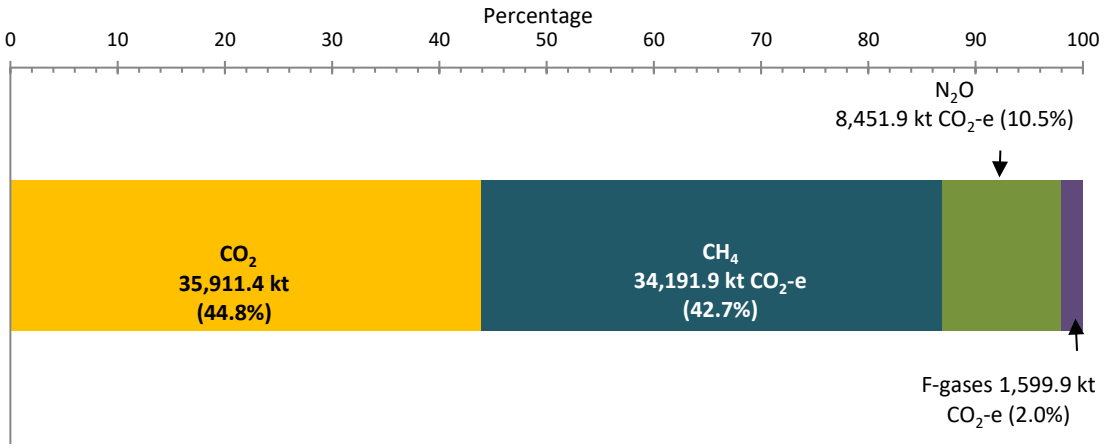
Between 1990 and 2015, net removals from the LULUCF sector decreased by 21.0 per cent from the 1990 level of –30,122.4 kt CO_2-e. This is largely the result of increased harvesting of plantation forests as a larger proportion of the estate reaches harvest age. Yearly fluctuations in emissions from LULUCF are mainly driven by harvesting and deforestation in production forests and uneven historical rates of new forest planting.

Emission trends by gas

In 2015, CH_4 and CO_2 contributed the largest proportion of total emissions (44.8 per cent and 42.7 per cent respectively). Nitrous oxide (10.5 per cent) and F-gases (HFCs, PFCs and SF_6) (2.0 per cent) made up the balance.

Figure 1.3 shows New Zealand's emissions profile by gas in 2015. Table 1.2 shows the change in each direct greenhouse gas between 1990 and 2015. Trends in emissions of CO_2, CH_4, N_2O and F-gases over the period 1990–2015 are shown in figure 1.4, using 1990 emissions as a base level.

Figure 1.3: New Zealand's total greenhouse gas emissions by gas in 2015



Note: CH_4 = methane; CO_2 = carbon dioxide; kt CO_2-e = kilotonnes carbon dioxide equivalent; F-gases are HFCs = hydrofluorocarbons, PFCs = perfluorocarbons and SF_6 = sulphur hexafluoride; N_2O = nitrous oxide.

Source: Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015.* Wellington: Ministry for the Environment.

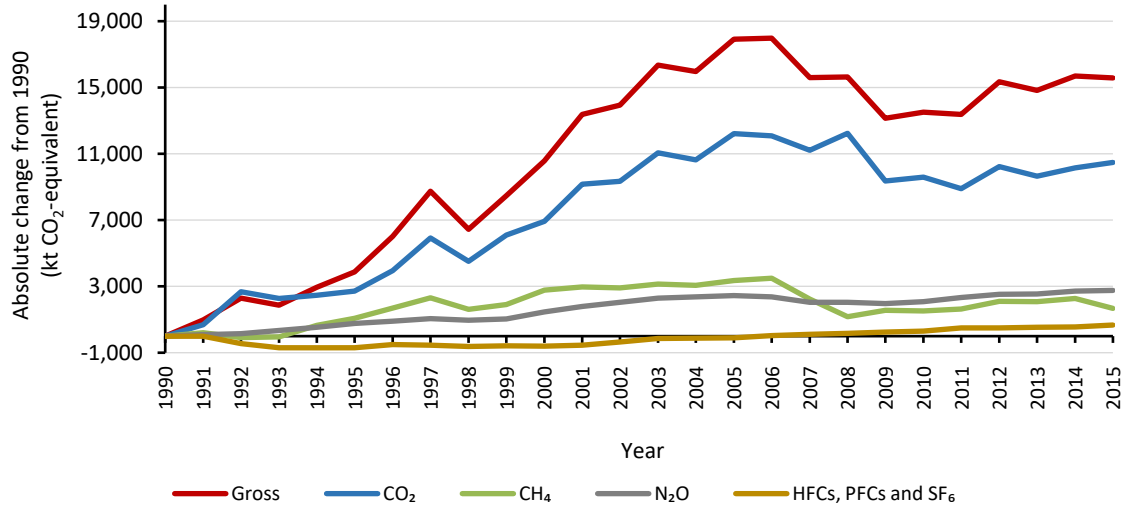
Table 1.2: New Zealand's emissions of greenhouse gases by gas in 1990 and 2015

Direct greenhouse gas emissions	kt CO_2-equivalent 1990	2015	Change from 1990 (kt CO_2-equivalent)	Change from 1990 (%)
CO_2	25,428.6	35,911.4	10,482.8	41.2
CH_4	32,522.2	34,191.9	1,669.7	5.1
N_2O	5,693.1	8,451.9	2,758.8	48.5
HFCs	0.0	1,523.5	1,523.5	NA
PFCs	909.9	58.6	–851.4	–93.6
SF_6	20.0	17.9	–2.1	–10.6
Gross, all gases	**64,573.8**	**80,155.1**	**15,581.3**	**24.1**

Note: The percentage change for hydrofluorocarbons (HFCs) is not applicable (NA) because consumption of HFCs in New Zealand in 1990 was not occurring (NO). CH_4 = methane; CO_2 = carbon dioxide; kt CO_2 = kilotonnes carbon dioxide; N_2O = nitrous oxide; PFCs = perfluorocarbons; SF_6 = sulphur hexafluoride.

Source: Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015.* Wellington: Ministry for the Environment.

Figure 1.4: Change in New Zealand's gross emissions by gas from 1990 to 2015



Note: CH_4 = methane; CO_2 = carbon dioxide; kt CO_2 = kilotonnes carbon dioxide; HFCs = hydrofluorocarbons; N_2O = nitrous oxide; PFCs = perfluorocarbons; SF_6 = sulphur hexafluoride.

Source: Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015.* Wellington: Ministry for the Environment.

More about emissions

For more information on New Zealand's greenhouse gas emissions, see the common tabular format (CTF) tables submitted with this report and reproduced below. See also *New Zealand's Greenhouse Gas Inventory* published in 2017, which can be viewed on the Ministry for the Environment website[6] and is also available on the UNFCCC website.

[6] Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015*. Wellington: Ministry for the Environment. Retrieved from www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-greenhouse-gas-inventory (12 October 2017).

National Inventory System

New Zealand's National Inventory System operates in line with relevant UNFCCC and Kyoto Protocol guidelines, and is constantly improved.

National inventory arrangements

The Climate Change Response Act 2002 was enacted to enable New Zealand to meet its international obligations under the UNFCCC and Kyoto Protocol. According to the UNFCCC definition, a national system for a Party included in Annex 1 includes all institutional, legal and procedural arrangements for estimating anthropogenic emissions by sources, and removals by sinks, of all greenhouse gases not controlled by the Montreal Protocol, and for reporting and archiving inventory information.

A ministerial directive for the administration of the Climate Change Response Act 2002 names the Ministry for the Environment as New Zealand's 'inventory agency'. The Ministry for the Environment is responsible for the overall development, compilation and submission of the inventory to the UNFCCC Secretariat. The Ministry for the Environment chairs a cross-agency reporting governance group that provides leadership over the reporting, modelling and projections of greenhouse gas emissions and removals. The Act also contains compliance provisions, including for the authorisation of inspectors to collect information needed to estimate emissions or removals of greenhouse gases.

New Zealand has developed its own National Inventory System guidelines that document the tasks required for making an official submission of the inventory. The guidelines cover multiple aspects of the inventory production including planning, inventory processes, quality assurance and control, and communication and error management. These guidelines detail a quality assurance and control plan to formalise, document and archive the quality assurance and control procedures.

Changes to arrangements

No changes have been made in the legal or institutional arrangements in the National Inventory System since the *Second Biennial Report* was submitted in December 2015.

Although there were no major changes in the structure of the national system, operational improvements to improve the quality of New Zealand's Inventory reports have occurred during the past two years. The focus of this work was making the National Inventory System more robust and achieving better transparency, comparability, consistency, completeness and accuracy in the inventory. Since New Zealand's *Second Biennial Report* was submitted, improvements in the inventory have focused on:

- making additional improvements to the accuracy of emissions and removals in all sectors
- reviewing the Terms of Reference for the Reporting Governance Group, which is responsible for approving all changes, improvements and major recalculations in the inventory
- updating quality control processes and procedures for sectors
- designing and developing computerised quality control tools to ensure better quality of the common reporting format (CRF) tables and comparability between the inventory report and the CRF

- developing the expertise of inventory officials
- inventory officials undertaking reviewer training under the UNFCCC for expert reviews of annual greenhouse gas inventories prepared using the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.[7]

For more information on New Zealand's National Inventory System and changes to arrangements since the *Second Biennial Report*, see annex B of the *Seventh National Communication*,[8] and *New Zealand's Greenhouse Gas Inventory* submitted in 2017.

[7] IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Hayama, Japan: Institute for Global Environmental Strategies. Retrieved from www.ipcc-nggip.iges.or.jp/public/2006gl/ (24 October 2017).

[8] Ministry for the Environment. 2013. *New Zealand's Sixth National Communication*. Wellington: Ministry for the Environment. Retrieved from www.mfe.govt.nz/publications/climate-change/new-zealands-sixth-national-communication-under-united-nations-framework (12 October 2017).

Chapter II: Quantified economy-wide emission reduction targets

Introduction

Climate change is a global issue, and New Zealand is fully committed to playing its part in a global response. To achieve this, New Zealand has set a number of targets for reducing greenhouse gas emissions and contributing to the global solution – in particular, New Zealand has made an ambitious first commitment under the Paris Agreement to meet an emissions budget for 2021–30. This chapter describes these targets, as well as conditions and assumptions that are relevant to achieving them.

New Zealand's targets

Since 2009, New Zealand has made commitments to four emission reduction responsibility targets:

1. an unconditional target of 5 per cent below 1990 levels by 2020 for the period 2013–2020
2. a conditional responsibility target of between 10 per cent and 20 per cent below 1990 levels by 2020
3. New Zealand's first Nationally Determined Contribution under the Paris Agreement to reduce emissions by 30 per cent below 2005 levels by 2030
4. a longer-term target to reduce emissions by 50 per cent below 1990 levels by 2050.

These targets are presented in further detail below.

Quantified economy-wide emission reduction targets for 2020

New Zealand put forward two economy-wide emission reduction responsibility targets for the period 2013–2020:

- an unconditional target of 5 per cent below 1990 levels by 2020
- a conditional target of between 10 per cent and 20 per cent below 1990 levels by 2020.[9]

These are the same as presented in New Zealand's *Second Biennial Report*.

New Zealand's unconditional 5 per cent target for 2020

On 16 August 2013, the New Zealand Government announced an unconditional target to reduce emissions to 5 per cent below 1990 emissions by 2020. For the period 2013–2020, New Zealand chose not to commit to a target under the Kyoto Protocol's second commitment period. Instead, New Zealand joined countries responsible for more than 70 per cent of global greenhouse gas emissions that have made international pledges under the United Nations Framework Convention on Climate Change (UNFCCC).

[9] As noted in: UNFCCC. 2011. FCCC/SB/2011/INF.1/Rev.1. Retrieved from https://unfccc.int/resource/docs/2011/sb/eng/inf01r01.pdf.

Based on UNFCCC methodology, this target is equivalent to a Quantified Emission Limitation or Reduction Objective (QELRO) of 96.8 per cent on 1990 emissions over the period 2013–2020. New Zealand prepared an initial report in 2016 to facilitate the calculation of its exact emissions budget for 2013–2020. Based on gross emissions in 1990, as reported in *New Zealand's Greenhouse Gas Inventory* submitted in 2016, this target corresponds to a carbon budget of 509.775 megatonnes of carbon dioxide equivalent for the period 2013–2020.[10]

New Zealand is applying the Kyoto Protocol framework of rules in reporting and measuring progress towards this unconditional target, to ensure that its actions are transparent and have integrity. This includes applying Kyoto Protocol accounting rules to the target, including those agreed in Durban in 2011 for land use, land-use change and forestry (Decision 2/CMP.7 refers). For 2013–2020, as a Party to the Kyoto Protocol, New Zealand is completing activity-based reporting under Article 3.3 of the Kyoto Protocol for afforestation, reforestation and deforestation, and forest management under Article 3.4 of the Kyoto Protocol.

Further information about this target is contained in CTF tables 2a–2f below.

CTF Table 2a: Emission reduction target: base year and target[a]

Base year/base period	1990
Emission reduction target	5 per cent below 1990 by 2020
Period for reaching the target	2013–2020

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

CTF Tables 2b and 2c: Description of quantified economy-wide emission reduction target[a]

Gases covered	Base year	Global warming potential
CO_2	1990	IPCC Fourth Assessment Report
CH_4	1990	IPCC Fourth Assessment Report
N_2O	1990	IPCC Fourth Assessment Report
HFCs	1990	IPCC Fourth Assessment Report
PFCs	1990	IPCC Fourth Assessment Report
SF_6	1990	IPCC Fourth Assessment Report
NF_3	1990	IPCC Fourth Assessment Report
Sectors covered	**Comments**	
Energy		
Transport[b]		
IPPU		
Agriculture		
LULUCF	LULUCF is not included in the target's base year emissions	
Waste		

[10] Ministry for the Environment. 2016. *New Zealand's report to facilitate the calculation of its emissions budget for the period 2013 to 2020*. Wellington: Ministry for the Environment. Retrieved from www.mfe.govt.nz/sites/default/files/media/Climate%20Change/New%20Zealand%27s%20Initial%20Report%20July%202016.pdf (12 October 2017).

Note: CH_4 = methane; CO_2 = carbon dioxide; HFCs = hydrofluorocarbons; IPCC = Intergovernmental Panel on Climate Change; IPPU = industrial processes and product use; LULUCF = land use, land-use change and forestry; NF_3 = nitrogen trifluoride; N_2O = nitrous oxide; PFCs = perfluorocarbons; SF_6 = sulphur hexafluoride.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] Transport is reported as a subsector of the energy sector.

CTF Table 2d: Approach to counting emissions and removals from the LULUCF sector[a]

Role of LULUCF	Comments
Emissions and removals from the LULUCF sector are counted towards achievement of the target	The LULUCF sector is not included in the target's base year emissions
The contribution of the LULUCF sector is calculated using an activity-based approach	Using Kyoto Protocol rules (ie, under Article 3.3 of the Kyoto Protocol for afforestation, reforestation and deforestation, and forest management under 3.4 of the Kyoto Protocol)

Note: LULUCF = land use, land-use change and forestry.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

CTF Table 2e: Possible scale of contributions of market-based mechanisms[a]

CERs	New Zealand will measure progress against its 2020 target as if it had made a commitment under the Kyoto Protocol for the second commitment period, including recognition of the surplus achieved during the first commitment period of the Kyoto Protocol. The scale of contributions of market mechanisms for New Zealand in meeting its 2020 target will not be known until the end of the 2013–2020 accounting period.
ERUs	
AAUs[b]	
Carry-over units[c]	
Other mechanism units under the Convention (specify)[d]	

Note: CERs = certified emission reductions; ERUs = emission reduction units; AAUs = assigned amount units.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] AAUs issued to or purchased by a Party.

[c] Units carried over from the first to the second commitment periods of the Kyoto Protocol, as described in Decision 13/CMP.1 and consistent with Decision 1 /CMP.8.

[d] As indicated in paragraph 5(e) of the guidelines contained in annex I of Decision 2/CP.17.

CTF Table 2f: Any other information

New Zealand is applying the Kyoto Protocol's second commitment period rules to its unconditional 2020 target. In practice however, some technical changes may be required to reflect the status of New Zealand's target (as the target is not inscribed in the third column of Annex B of the Doha Amendment to the Kyoto Protocol). New Zealand reserves the right to review the accounting rules it applies to ensure alignment with the Kyoto Protocol and to support a smooth transition to the Paris Agreement.

New Zealand's conditional 10 per cent to 20 per cent target for 2020

In August 2009, the New Zealand Government announced a 2020 target range to signal New Zealand's commitment to comprehensive efforts to address global climate change. New Zealand stated that it was prepared to take on a responsibility target for greenhouse gas

emission reductions of between 10 per cent and 20 per cent below 1990 levels by 2020, subject to conditions including full recourse to a broad and efficient international carbon market. These conditions have not currently been met.[11]

New Zealand's first Nationally Determined Contribution

On 7 July 2015, the New Zealand Government submitted its Intended Nationally Determined Contribution (INDC) to the UNFCCC Secretariat for the period 2021–2030, along with accompanying information to facilitate clarity, transparency and understanding.[12] This included an addendum submitted in November 2015 that clarified the approach New Zealand proposed to use to account for forestry and land use.

The Government submitted New Zealand's first Nationally Determined Contribution (NDC) under the Paris Agreement in October 2016. New Zealand commits to reduce emissions to 30 per cent below 2005 levels by 2030. The 2005 reference year was chosen for ease of comparability with other Parties. This target corresponds to a reduction of 11 per cent from 1990 levels.

A full version of New Zealand's first NDC can be found on the UNFCCC Secretariat's interim NDC registry page.[13] The target is expressed as an absolute reduction target managed using an emissions budget for the period 2021 to 2030 inclusive.

New Zealand will meet its emissions budget for the period 2021–2030 through a combination of:

- domestic emission reductions
- removal of carbon dioxide by forests
- participation in international carbon markets.

New Zealand's 2050 target

In March 2011, the New Zealand Government notified in the *New Zealand Gazette* (New Zealand's official government newspaper and journal of constitutional record) a target for a 50 per cent reduction in greenhouse gas emissions from 1990 levels by 2050. The 1990 level is based on New Zealand's gross greenhouse gas emissions as per the agreed accounting rules of the Kyoto Protocol under the UNFCCC.

The 2050 target is based on New Zealand's net greenhouse gas emissions and will take into account any removals or emissions arising from afforestation or deforestation since 1990, consistent with the Kyoto Protocol.

New Zealand will continue to regularly review its contributions to international mitigation action taking into account the latest science, development of new technologies, and progress by other countries as well as the requirement for a five-yearly global stocktake under the Paris Agreement.

---

[11] New Zealand's conditional 2020 target. (16 May 2016). Retrieved from www.mfe.govt.nz/climate-change/reducing-greenhouse-gas-emissions/new-zealands-greenhouse-gas-emissions-reduction-2 (12 October 2017).

[12] In line with Decisions 1/CP.19 and 1/CP.20.

[13] See www4.unfccc.int/ndcregistry/Pages/Home.aspx for further information.

Chapter III: Progress in achievement of quantified economy-wide emission reduction targets and relevant information

Mitigation actions and their effects

Mitigation actions

New Zealand's policy response to emission reductions is informed by a combination of its unique national circumstances, the level of its targets,[14] and recognition that climate change is a long-term issue, necessitating a global response. New Zealand is committed to being part of this response, as was shown with its ratification of the Paris Agreement on 4 October 2016.

New Zealand's economy features a strong agricultural export focus, with around 85 per cent of agricultural production going to international markets. For many developed countries, the agricultural sector constitutes only a small proportion of emissions, on average around 12 per cent, whereas agriculture in New Zealand makes up almost half of total greenhouse gas emissions.[15]

New Zealand has abundant, diverse renewable energy resources and a proud history of renewable electricity development. Around 85 per cent of electricity has been generated from renewable sources in recent years (with a target of 90 per cent by 2025) – this is amongst the highest of countries within the Organisation for Economic Co-operation and Development (OECD).[16] Although hydroelectricity is the predominant renewable energy source, there is a growing share of generation from wind, geothermal and solar. The New Zealand Government has implemented the Electric Vehicles Programme to take advantage of this high proportion of renewable electricity generation. However, New Zealand's long, thin, mountainous geography, low, dispersed population, and distant location from its main trading markets have contributed to a reliance on fossil fuels in transport to date.

These particular national features mean that the cost of mitigation is likely to be higher for New Zealand than for many other developed countries. Remaining competitive with trade partners while taking responsibility for emission reduction targets presents a challenge for New Zealand.

New Zealand continues to develop a broad portfolio of measures to reduce emissions. This takes account of the Government's wider goals and includes both domestic and global actions.

---

[14] Described in chapter II of this report.

[15] Ministry for the Environment. (2017). *New Zealand's Greenhouse Gas Inventory 1990–2015*. Wellington: Ministry for the Environment. Retrieved from www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-greenhouse-gas-inventory (12 October 2017).

[16] Ministry of Business and Innovation. (5 October 2017). *New Zealand Energy Quarterly*. Retrieved from www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/publications/new-zealand-energy-quarterly (12 October 2017).

New Zealand Emissions Trading Scheme

The New Zealand Emissions Trading Scheme (NZ ETS) is New Zealand's principal policy response for reducing domestic emissions and its primary mechanism to meet international emission reduction commitments. The NZ ETS is designed to create financial incentives to:

- reduce emissions in New Zealand
- invest in clean technology and renewable power generation
- encourage afforestation and reduce deforestation.

The NZ ETS creates an obligation on emitters that are participants in the scheme to report on their emissions and to surrender emission units that correspond to their obligations. Some types of international emission units, issued under the Kyoto Protocol, could be imported and surrendered until May 2015. After that date, the NZ ETS transitioned into a domestic-only scheme.

The NZ ETS creates reporting and surrender obligations on participants within the forestry, industrial processes, stationary energy, liquid fossil fuels and waste sectors. The agriculture sector has also been required to report on its major emissions sources (methane and nitrous oxide from fertiliser use and livestock) since 1 January 2012. The Government has indicated that emissions from agriculture will be subject to surrender obligations in the NZ ETS only if economically viable and practical technologies are available to reduce emissions and New Zealand's trading partners make more progress on tackling their emissions in general.

Productivity Commission inquiry

The New Zealand Government tasked an independent body known as the Productivity Commission to look at how New Zealand can maximise the opportunities and minimise the costs and risks of transitioning to a lower net emissions economy. In August 2017, the Commission published an issues paper that aimed to help individuals and organisations to participate in the inquiry. A final report to the Government is due by 30 June 2018.

Establishment of reference groups

The New Zealand Government established of the following reference groups to provide specific advice:

- Biological Emissions Reference Group to build a solid evidence base to ensure New Zealand has the best information on what the sector can do to reduce emissions
- Forestry Reference Group to look at the important role the forestry sector can play in helping New Zealand meet its long-term climate change targets
- Climate Change Adaptation Technical Working Group to look at options for how New Zealand can build resilience to the effects of climate change while growing its economy sustainably.

International carbon markets project

An international carbon markets project was established in 2016 to identify international emissions trading options, with a view to enabling New Zealand to source international emission reductions in the 2020s.

Low emissions economy transition hub

A low emissions economy transition hub was established within Natural Resources Sector government agencies in 2017. This hub brings relevant government agencies together to work and partner with the private sector, where appropriate. The hub is designed to provide costed, tested and modelled policy options for meeting New Zealand's Nationally Determined Contributions (NDCs) under the Paris Agreement. The hub's work will be informed by the recommendations made by the Productivity Commission and various climate change reference groups established in 2017. This includes developing options on the balance of domestic emission reductions, forestry, and international emission reductions to contribute towards meeting New Zealand's first NDC.

Electric Vehicles Programme

The New Zealand Government has established the Electric Vehicles Programme, which introduces measures to increase the uptake of electric vehicles – leveraging New Zealand's high proportion of renewable electricity – including:

- a target of doubling the number of electric vehicles in New Zealand every year to reach approximately 64,000 by the end of 2021
- extending the road user charges exemption on light electric vehicles until they make up 2 per cent of the light vehicle fleet and introducing a new road user charges exemption for heavy electric vehicles until they make up 2 per cent of the heavy vehicle fleet[17]
- government agencies coordinating activities to support the development and roll-out of public charging infrastructure, including providing information and guidance
- an NZ$1 million annual contribution for a nation-wide electric vehicle information and promotion campaign that contributes to the accelerated uptake of electric and/or other low emission vehicles over five years
- establishment of a low emission vehicles contestable fund of up to NZ$6 million per year to encourage and support innovative low emission vehicle projects.

New Zealand Energy Efficiency and Conservation Strategy 2017–2022

The Government has continued to invest in programmes run by the Energy Efficiency and Conservation Authority (EECA) to improve energy efficiency and the uptake of renewable energy technologies. These programmes are guided by the New Zealand Energy Efficiency and Conservation Strategy (NZEECS) 2017–2022. The NZEECS has a goal for New Zealand to have an energy productive and low emission economy and focuses on three priority areas: efficient and renewable process heat, efficient and low emissions transport, and innovative and efficient electricity. The NZEECS also states three targets, one for each priority area:

1) decrease in industrial emissions intensity of at least 1 per cent per annum on average between 2017 and 2022
2) electric vehicles make up 2 per cent of the vehicle fleet by the end of 2021
3) ninety per cent of electricity will be generated from renewable sources by 2025.

[17] Anyone using New Zealand's roads contributes towards their upkeep. Most road users pay levies in the prices of their fuel. Others, such as drivers of light diesel vehicles and diesel-powered heavy vehicles like trucks, pay imposed fees known as road user charges.

Energy Efficiency and Conservation Authority funding changes to focus on process heat and transport

The New Zealand Government has changed the way it funds EECA to enable EECA to focus on the more carbon-intensive sectors of the economy, for example, process heat and transport. In 2017/18, the Crown intends to recover funding through the levies on electricity and transport fuels. EECA will use the levy funding to run programmes directly linked to the source of funding and will demonstrate the links by reporting back to levy payers every year.

Increased active transport funding

The Government is also investing a total planned NZ$333 million on constructing cycling infrastructure in main urban centres.

Research and development

New Zealand continues to take action to reduce emissions both nationally and globally by funding research and technology development, and by sharing technical expertise, particularly in the agriculture sector including through the Global Research Alliance on Agricultural Greenhouse Gases to increase:

- international cooperation and collaboration
- investment in research, development and the extension of technologies and practices that will help deliver ways to grow more food and more climate-resilient food systems, without increasing greenhouse gas emissions.

The New Zealand Agricultural Greenhouse Gas Research Centre also focuses on five areas of research: mitigating methane emissions, mitigating nitrous oxide emissions, increasing soil carbon, integrated farm systems and assisting the Māori pastoral sector.

Afforestation Grant Scheme

The Government has provided new funding for 2015–2020 to encourage and support the planting of new forests through the Afforestation Grant Scheme.

Other policies and measures

A full list of relevant policies and measures that will enable New Zealand to meet its unconditional 2020 target is provided in CTF Table 3 of this chapter.

Review

Key domestic policy reviews completed since New Zealand's *Second Biennial Report*,[18] and upcoming planned reviews, include:

- a review of the NZ ETS between November 2015 and July 2017
- staged removal of a transitional measure in the NZ ETS that allowed non-forestry participants to surrender only one New Zealand Unit for each 2 tonnes of emissions

[18] For a copy of the *Second Biennial Report*, please see the Ministry for the Environment's website, www.mfe.govt.nz/publications/climate-change/nz-second-biennial-report-under-unfccc.

- an annual survey of forest owners' intentions, including the effect of the NZ ETS and other policy measures[19]
- voluntary participation in an Asia–Pacific Economic Cooperation (APEC) fossil fuel subsidy reform peer review in March 2015 aimed at identifying any inefficient fossil fuel subsidies that lead to wasteful consumption[20]
- EECA and the Ministry of Business, Innovation and Employment reviewed 12 EECA programmes in 2016 to assess how they fitted with anticipated opportunities.[21]

Domestic institutional arrangements

New Zealand ratified the Kyoto Protocol in December 2002 and ratified the second commitment period of the Kyoto Protocol by accepting the Doha Amendment on 30 November 2015. On 4 October 2016, New Zealand ratified the Paris Agreement.

The Climate Change Response Act 2002 established the legal framework to enable New Zealand to meet its obligations under both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The NZ ETS was established through the Act and came into effect in 2008. The Act also provided for the phased entry of sectors into the NZ ETS.

The Ministry for the Environment is a statutory entity[22] and the Government's primary advisor on matters relating to climate change, the environment and international matters affecting the environment. The Act is administered by the Ministry for the Environment.

The Act established an inventory agency[23] and a registry to record holdings and transfers of units. A ministerial directive for the administration of the Act names the Ministry for the Environment as New Zealand's inventory agency, with responsibility for recording and reporting information related to greenhouse gas emissions in accordance with international requirements.

The Ministry for the Environment coordinates and leads climate change policy across government, with sector-specific policies and/or their implementation being led by other departments. The full list of these departments and details about their roles and functions is outlined in chapter 4 of New Zealand's *Seventh National Communication*.[24]

---

19 For copies of the annual survey, please see the Ministry for Primary Industries' website, https://mpi.govt.nz/news-and-resources/statistics-and-forecasting/forestry/.

20 The findings of the review can be found on the Ministry of Business, Innovation and Employment's website, www.mbie.govt.nz/info-services/sectors-industries/energy/international-relationships/apec-fossil-fuel-subsidy-reform-peer-review.

21 The conclusions and recommendations of the reviews can be found on the Energy Efficiency and Conservation Authority's website, www.eeca.govt.nz/assets/Resources-EECA/Programme-Review-Conclusions-and-Recommendations-September-2016-2.pdf.

22 The Ministry for the Environment was established under the Environment Act 1986.

23 The Climate Change Response Act 2002 describes the responsibilities of the Inventory agency as including data collection, reporting and archiving of information. See chapter 13 of *New Zealand's Greenhouse Gas Inventory* for a description of New Zealand's national system for its greenhouse gas inventory.

24 For a copy of the *Seventh National Communication*, see the Ministry for the Environment's website, www.mfe.govt.nz/publications/climate-change/new-zealands-seventh-national-communication-under-united-nations.

The Environmental Protection Authority (EPA) is responsible for the operational elements of the NZ ETS. This includes processing and making decisions about industrial allocations, entitlements and non-forestry emission returns. The EPA helps participants to ensure they meet their obligations, and it can take compliance action where necessary.

The EPA also manages the New Zealand Emissions Trading Register and ensures the integrity, security and availability of the Register. The Register system was upgraded in August 2016 and continues to conform to all the technical requirements for registries under the Kyoto Protocol, including its connection to the International Transaction Log.

There have been no significant changes to domestic institutional arrangements since the release of New Zealand's *Sixth National Communication* and *First Biennial Report*.

Economic and social impacts of response measures

Legislative decisions on climate change response measures made by the New Zealand Government must have the support of the majority of the Parliament before they can be passed into law. The public consultation phase of the legislative process allows any member of the public, or organisations, to raise concerns and issues about proposed measures.

In addition, legislation (whether it is primary legislation introduced to Parliament or secondary legislation in any sector) must be underpinned by a regulatory impact analysis that includes assessment of the economic and social impacts of the measure.

The Act provides for review of the NZ ETS. The first review included an examination of the environmental, social and economic impacts across sectors of the economy – including lower income households and Māori. The second review of the NZ ETS was carried out in two stages between 2015 and 2017. This review took into consideration the distribution of impacts of the scheme between sectors and groups. As a result of the first stage of this review, the transitional measure that reduced non-forestry surrender obligations is now being phased out.

The Ministry of Foreign Affairs and Trade provides the Government with advice on international aspects of proposed policies. New Zealand's regular trade, economic and political consultation with other governments, including some non-Annex I Parties, also provides opportunities for those countries to raise any concerns directly. More detailed information on the implementation of policies and measures that minimise adverse social, environmental and economic impacts on non-Annex 1 Parties can be found in chapter 15 of *New Zealand's Greenhouse Gas Inventory 1990–2015*.[25]

Estimates of emission reductions and removals

Table 3.1 presents New Zealand's total (gross) greenhouse gas emissions in 1990 and 2015. This table is based on details from *New Zealand's Greenhouse Gas Inventory*, as submitted to the UNFCCC Secretariat in May 2017.[26]

---

[25] Ministry for the Environment. 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015*. Wellington: Ministry for the Environment. Retrieved from www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-greenhouse-gas-inventory (12 October 2017).

[26] See www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-greenhouse-gas-inventory for further information.

Table 3.1: New Zealand's emissions of greenhouse gases by sector in 1990 and 2015

Sector	kt CO_2-equivalent 1990	2015	Change from 1990 (kt CO_2-equivalent)	Change from 1990 (%)
Energy	23,748.5	32,445.2	+8,706.7	+36.7
Industrial processes and product use	3,584.4	5,279.7	+1,695.3	+47.3
Agriculture	33,122.9	38,419.6	+5,296.7	+16.0
Waste	4,1180.0	4,000.7	–117.4	–2.9
Total (excluding LULUCF)	**64,573.8**	**80,155.1**	**+15,581.3**	**+24.1**
LULUCF	–30,122.4	–23,782.6	+6,339.8	+21.0
Net total (including LULUCF)	**34,451.4**	**56,372.5**	**+21,921.1**	**+63.6**

Note: Net removals from the land use, land-use change and forestry (LULUCF) sector as reported under the UNFCCC (chapter 6 of *New Zealand's Greenhouse Gas Inventory*). Columns may not total due to rounding. kt CO_2 = kilotonnes carbon dioxide.

Source: Ministry for the Environment, 2017. *New Zealand's Greenhouse Gas Inventory 1990–2015.* Wellington: Ministry for the Environment.

Reporting for the period 2013–2020

As noted in chapter II, New Zealand is applying the Kyoto Protocol framework of rules in reporting and measuring progress towards its unconditional target for the period 2013–2020, to ensure transparency and integrity.

Based on UNFCCC methodology, New Zealand's unconditional target for 2013–2020 is equivalent to a Quantified Emission Limitation or Reduction Objective (QELRO) of 96.8 per cent on 1990 emissions over the period 2013–2020. Based on gross emissions in 1990, as presented in chapter I and this chapter, this QELRO corresponds to a carbon budget of 516.68 million tonnes of carbon dioxide equivalent for the period 2013–2020.

Table 3.2 presents New Zealand's net emissions and removals from land under the Kyoto Protocol reported under New Zealand's unconditional 2020 target for the period 2013–2015. This includes not only land reported under Article 3.3 of the Kyoto Protocol (afforestation/ reforestation and deforestation) but also land reported under Article 3.4 (forest management), though accounting for this land is against the forest management reference level.[27]

[27] New Zealand Government Submission – Forest Management Reference Level, 12 April 2011. Retrieved from http://unfccc.int/documentation/documents/advanced_search/items/6911.php?priref=600006559#beg (12 October 2017).

Table 3.2: New Zealand's net emissions and removals from land under the Kyoto Protocol as reported for the period 2013–2015

		2013	2014	2015
Afforestation and reforestation				
	Net cumulative area since 1990 (ha)	643,566	645,883	647,558
	Area in calendar year (ha)	4,126	3,023	2,471
	Emissions in calendar year (kt CO_2-e)	–15,704.1	–15,803.3	–16,001.2
Deforestation				
	Net cumulative area since 1990 (ha)	174,220	182,985	188,409
	Area in calendar year (ha)	9,712	8,765	5,424[P]
	Emissions in calendar year (kt CO_2-e)	6,338.9	6,265.1	3,465.8
Forest management				
	Area included (ha)	9,269,997	9,261,938	9,257,310
	Emissions in calendar year (kt CO_2-e)	–13,237.1	–13,261.4	–12,106.2
Total area included (ha)		10,087,784	10,090,807	10,093,277
Emissions in calendar year (kt CO_2-e)		**–22,602.3**	**–22,799.6**	**–24,641.5**
Accounting quantity (kt CO_2-e)		**–9,365.2**	**–9,538.2**	**–12,535.3**

Note: The accounting quantity for the period 2013–2020 is calculated by applying the accounting rules from Decision 2/CMP.7 to net emissions.

Note: The forest management reference level is technically corrected each year so it maintains consistency with changes to reporting made subsequent to the New Zealand Government's 2011 Forest Management Reference Level Submission. ha = hectares; kt CO_2-e = kilotonnes carbon dioxide equivalent; P = provisional.

Source: Ministry for the Environment. 2015. *New Zealand's Greenhouse Gas Inventory 1990–2015.* Wellington: Ministry for the Environment.

Projections and the use of units from the market-based mechanism and Kyoto accounting rules for LULUCF

Table 3.3 shows how New Zealand is tracking to meet the unconditional 2020 emission reduction targets. The table gives actual emissions and removals reported up to 2015 (as in *New Zealand's Greenhouse Gas Inventory* submitted in 2017) and projected emissions and removals up to 2020.

New Zealand's emissions budget for the 2013–2020 period is 509.8 million tonnes carbon dioxide equivalent. New Zealand has 123.7 million Kyoto Protocol emission units recognised as eligible for carryover after making its retirement for the first Kyoto commitment period.[28] Based on the figures shown in table 3.3, it is projected that New Zealand will recognise 26.1 million of these units to meet its 2020 target.

CTF tables 4, 4(a)ii and 4b provide a further breakdown of historic data as New Zealand tracks towards its 2020 target including any units from market based mechanisms.

[28] Final compilation and accounting report for New Zealand for the first commitment period of the Kyoto Protocol. Retrieved from http://unfccc.int/resource/docs/2016/car/nzl.pdf (12 October 2017).

Table 3.3: Sector breakdown of emissions and removals for 2013 to 2020 (million tonnes carbon dioxide equivalent)

	Historic				Projected				
	2013	2014	2015	2016	2017	2018	2019	2020	Total
Stationary energy	17.8	18.1	17.7	19.2	18.9	19.4	19.2	18.4	148.7
Transport	14.1	14.2	14.8	14.9	15.0	15.0	15.0	15.0	118.0
IPPU	4.9	5.1	5.3	5.2	5.3	5.4	5.4	5.5	42.1
Agriculture	38.5	38.8	38.4	37.6	37.7	37.9	38.2	38.4	305.6
Waste	4.1	4.1	4.0	4.1	4.1	4.2	4.2	4.3	33.1
Gross emissions	**79.4**	**80.3**	**80.2**	**81.0**	**81.0**	**81.9**	**82.1**	**81.7**	**647.5**
Contribution from LULUCF	–9.4	–9.5	–12.5	–12.7	–13.6	–14.2	–16.3	–15.3	–103.7
Net emissions									543.8

Note: IPPU = industrial processes and product use; LULUCF = land use, land-use change and forestry.

Note: Data for years with black shading are based off historic data reported in *New Zealand's Greenhouse Gas Inventory 1990–2015*, data for the grey years are projected, as reported in Chapter IV.

CTF Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
New Zealand Emissions Trading Scheme (NZ ETS)	Yes	Forestry, Energy, Fishing, Industry, Liquid fossil fuels, Synthetic gases, Waste	CO_2, CH_4, N_2O, PFCs, HFCs, SF_6	Aims to reduce emissions by making emitters pay for emissions covered by the scheme.	Economic, regulatory	Implemented	The NZ ETS covers all sectors and all gases with reporting and/or surrender obligations. The 2012 amendments removed the date for biological emissions from agriculture to assume surrender obligations.	2008 (Entry has been phased by sector)	Environmental Protection Authority, Ministry for the Environment, Ministry for Primary Industries	2,930
Low Emissions Economy Transition Hub	No	Forestry, Energy, Marine, Aviation Industry, Liquid fossil fuels, Synthetic gases, Waste	CO_2, CH_4, N_2O, PFCs, HFCs, SF_6	Advises on meeting New Zealand's Nationally Determined Contributions (NDCs) under the Paris Agreement.	Financial, regulatory, economic industry support, information	Implemented	Cross-government work programme to provide costed, tested and modelled policy options for meeting New Zealand's NDCs under the Paris Agreement. Brings Natural Resources Sector agencies together and works in partnership with industry where appropriate in a low emissions economy transition hub.	2017	Ministry for the Environment	NE
ENERGYWISE	Yes	Energy (residential)	CO_2	Aims to increase energy efficiency in homes by providing information.	Information	Implemented	ENERGYWISE is the overall brand for the consumer energy efficiency information programme including tools and campaigns.	2009	Energy Efficiency and Conservation Authority	28

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
Warm Up New Zealand: Healthy Homes 2013–2018	Yes	Energy (residential)	CO_2	Warmer, drier homes through improved thermal performance.	Financial and industry support	Implemented	Warm Up New Zealand: Healthy Homes offers insulation retrofits to low income and/or high health need households and has a target to insulate 66,000 households. The Energy Efficiency and Conservation Authority (EECA) has taken a partnership approach by working with third-party funders in the community to leverage government grants.	2013[29]	Energy Efficiency and Conservation Authority	7
Efficient Products Programme	Yes	Energy	CO_2	Aims to help New Zealand households and businesses to purchase and use products that use less energy and save money.	Regulatory, information	Implemented	A joint Equipment Energy Efficiency (E3) Programme has been developed with Australia. Energy efficiency measures, including energy rating labelling for a range of residential, commercial and industrial products, along with mandatory performance standards, allow both countries to set consistent standards and measures for energy efficiency.	2002	Energy Efficiency and Conservation Authority	312

[29] An earlier scheme with wider eligibility criteria Warm Up New Zealand: Heat Smart ran from 2009 to 2013.

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
Large Energy User Programme	Yes	Energy (commercial, industrial, public sector)	CO_2	Promotes best practice energy management in energy intensive businesses.	Information, financial and industry support	Implemented	Through its Large Energy User Programme, EECA works with large energy users across New Zealand to commit to finding long-term energy management solutions focusing on efficiency and fuel switching.	2012	Energy Efficiency and Conservation Authority	115
Commercial buildings programmes	Yes	Energy (commercial, public sector)	CO_2	Improve the energy performance of new and existing commercial buildings.	Information, financial and industry support	Implemented	Commercial buildings performance advice provides design advice to owners and developers to ensure that energy efficient building and plant options are embedded in the design and fit out of new and major refurbishments. NABERSNZ™ is a system for rating the energy efficiency of existing office buildings and identifies opportunities for implementing building energy performance improvements.	2013	Energy Efficiency and Conservation Authority	NE
Energy efficiency in government – government procurement and property	No	Energy	CO_2	The programme aims to make sustainable procurement part of government procurement practice.	Fiscal, information	Implemented	The reforms are based on three core elements: policy transformation, capability building and greater use of collaborative contracts.	2009	Ministry of Business, Innovation and Employment	NE

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
Vehicle fuel economy labelling	Yes	Transport	CO_2	A compulsory scheme requiring vehicle traders and online vendors to display information relating to fuel economy.	Regulatory, information	Implemented	Allows consumers to make more informed vehicle purchase choices and to place an appropriate value on fuel economy.	2008	New Zealand Transport Agency and the Energy Efficiency and Conservation Authority	41
Voluntary Biofuels Sustainability Reporting Scheme	No	Transport	CO_2	Information about sustainable biofuels to give consumers confidence in the environmental credibility of biofuels sold in New Zealand.	Information, education	Implemented	The Voluntary Biofuels Sustainability Reporting Scheme lists the availability of biofuel blends around the country, GHG emission reductions from the use of biofuels, and other sustainability benefits from biofuel blends.	2009	Energy Efficiency and Conservation Authority	NA
Electric Vehicles Programme	No	Transport	CO_2	A package of initiatives promoting uptake of electric vehicles in New Zealand.	Fiscal, information, education	Implemented	A package of measures to reduce barriers to consumers and businesses choosing electric vehicles. This includes a target of 64,000 electric vehicles by 2021; extending the exemption on road user charges for electric vehicles; a nation-wide electric vehicle information and promotion campaign; and a contestable fund of up to NZ$6 million per year to encourage and support innovative low emission vehicle projects.	2016 (road user charges exemption began in 2009)	Ministry of Transport, Energy Efficiency and Conservation Authority and the New Zealand Transport Agency	NE

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
Other transport measures	No	Transport	CO_2	A range of other measures affecting GHG emissions from rail and road transport.	Fiscal, education	Implemented	These include research into intelligent transport systems, improvements to roading and rail infrastructure, and promoting the use of public transport in New Zealand.	NA	Ministry of Transport and the New Zealand Transport Agency	NE
Global Research Alliance on Agricultural Greenhouse Gases	No	Agriculture	CH_4, N_2O, CO_2	Increase international collaboration and investment in research into increasing agricultural and food production without growing GHG emissions.	Research, information, training, education	Implemented	The Global Research Alliance on Agricultural Greenhouse Gases was launched in December 2009 and now has 46 member countries from all regions of the world. More information is available at globalresearchalliance.org/.	2009	Secretariat support and co-Chair of the Livestock Research Group provided by New Zealand	NE
Biological Emissions Reference Group	No	Agriculture	CH_4, N_2O, CO_2	The purpose of the group is to build robust and agreed evidence on what the sector can do on-farm to reduce emissions and to assess the costs and opportunities of doing so. The evidence is to inform future actions or policies to reduce biological emissions from agriculture.	Research, information	Implemented	The Biological Emissions Reference Group (BERG) is a joint government and industry reference group that was established by the Government in September 2016.	2016	Ministry for Primary Industries	NE
Primary Growth Partnership	No	Agriculture	CH_4, N_2O, CO_2	To boost the economic growth and sustainability of New Zealand's primary, forestry and food sectors.	Research, information, training	Implemented	Provides funding for programmes of research and innovation.	2009	Ministry for Primary Industries	NE

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
New Zealand Agricultural Greenhouse Gas Research Centre	No	Agriculture	CH_4, N_2O, CO_2	Focuses on ways to increase productivity and reduce on-farm methane and nitrous oxide emissions.	Research, information, capability building, education	Implemented	Brings together nine research organisations.	2010	Ministry for Primary Industries	NE
Pastoral Greenhouse Gas Research Consortium	No	Agriculture	CH_4, N_2O	To provide livestock farmers with the information and means to mitigate their GHG emissions.	Research, information, education	Implemented	A research partnership between the Government and the dairy, sheep, beef, deer, fertiliser and agricultural research sectors.	2002	Ministry of Business, Innovation and Employment	NE
Sustainable Land Management and Climate Change Plan of Action	No	Agriculture	CH_4, N_2O, CO_2	Research programmes in agriculture and forestry sectors.	Research, information, education, capability building	Implemented	Initiatives and programmes in the agricultural and forestry sectors that focus on adaptation to climate change, reducing emissions and enhancing sinks, and new business opportunities.	2007	Ministry for Primary Industries	NE
Climate Change Forestry Reference Group	No	Forestry	CO_2	The purpose of the group is to explore and test evidence, analysis, and policy options with experts in order to inform and support officials.	Research, information	Implemented	Established in August 2016 by the Government, the group is made up of individuals who have strong experience and expertise in the forestry sector, carbon forestry, post-1989 forestry participation in the NZ ETS, permanent carbon forestry, farm forestry and Māori forestry.	2016	Ministry for Primary Industries	NE

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
Permanent Forest Sink Initiative	Yes	Forestry	CO_2	Promote the establishment of permanent forests on previously unforested land.	Fiscal, voluntary agreement	Implemented	Offers assigned amount units for carbon sequestered in permanent forests established after 1 January 1990.	2008	Ministry for Primary Industries	197
Erosion Control Funding Programme (formerly the East Coast Forestry Project)	Yes	Forestry	CO_2	The main purpose of this project is to reduce erosion by encouraging tree planting on erosion-prone land. The project also enhances the sequestration of carbon in forest sinks.	Fiscal, voluntary agreement	Implemented	Since 1992, the Ministry for Primary Industries has provided funding to landholders to prevent and control erosion. The grant can be used to control erosion on the worst eroding or erosion-prone land in the district by providing effective tree cover through planting or encouraging natural reversion to native bush.	1992	Ministry for Primary Industries	1,435
Sustainable Land Management Hill Country Erosion Programme	Yes	Forestry	CO_2	The Sustainable Land Management Hill Country Erosion Programme helps protect New Zealand's estimated 1.4 million hectares of pastoral hill country that is classified as erosion prone.	Fiscal, voluntary agreement	Implemented	The purpose of the programme is to speed up the rate of treatment of erosion-prone land. Projects deliver sustainable land management treatments including wide-spaced poplar and willow planting, small-scale afforestation, reversion to indigenous forest and retirement of land – treating over 3500 hectares each year. The fund also supports catchment facilitation work and capability building initiatives.	2008	Ministry for Primary Industries	161

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
Afforestation Grant Scheme	Yes	Forestry	CO_2	The scheme offers a contestable fund that aims to increase the area of Kyoto forest in New Zealand by offering a simpler alternative to the NZ ETS for land owners establishing new forests.	Fiscal, voluntary agreement	Implemented	Land owners who have received a grant have ongoing obligations to maintain their grant forests for a minimum 10-year period.	2008	Ministry for Primary Industries	491
Waste Minimisation Act 2008	No	Waste	CH_4, CO_2	The purpose is to encourage waste minimisation and decrease waste disposal to protect the environment from harm and provide environmental, social, economic and cultural benefits.	Regulatory	Implemented	A legislative measure passed by Parliament in 2008 that provides settings for frameworks for waste minimisation.	2008	Ministry for the Environment	11
National Environmental Standard for Landfill Methane	No	Waste	CH_4	The objective of the landfill gas standards is the effective management of discharges to air of GHGs (mainly methane) generated from large landfills.	Regulatory	Implemented	Requires landfill sites with a lifetime design capacity of greater than 1 million tonnes of refuse to collect and destroy methane emissions.	Standard came into effect in 2004 with full compliance required by 2007.	Ministry for the Environment and regional and local councils	711

Name of mitigation action	Included in 'with measures' GHG projection scenario	Sectors affected	GHG(s) affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2-e) 2020
Waste Minimisation Fund	No	Waste	CH_4, CO_2	The levy is imposed on waste disposed to landfill that generates funds to use for waste minimisation activities. These funds are distributed to territorial authorities and waste minimisation projects (via the Waste Minimisation Fund). The purpose of the fund is to increase resource efficiency, increase reuse, recovery and recycling, and decrease waste to landfill.	Fiscal	Implemented	The funding comes from a waste disposal levy imposed under the Waste Minimisation Act 2008.	Funding began in 2010.	Ministry for the Environment	NE
National Policy Statement for Freshwater Management (NPS-FM)	Yes	Agriculture	CH_4, N_2O	Aims to improve the quality of fresh water in New Zealand. Its implementation will have a co-benefit of reducing agricultural emissions by placing additional pressure on agricultural production, livestock numbers and agricultural land use, and practices to reduce nitrogen losses to waterways will have co-benefits for nitrous oxide emissions.	Regulatory	Partially implemented	Requires regional councils to establish water quality objectives for catchments in their region. Regional council progress implementing the NPS-FM varies across the country; many councils have made good progress to identify objectives and set limits. However, and not unexpectedly, no council has implemented the NPS-FM in its entirety.	2011	Regional and local councils	274

Note: The final column specifies the year identified by the Party for estimating impacts (based on the status of the measure and whether an ex-post or ex-ante estimation is available).
CH_4 = methane; CO_2 = carbon dioxide; GHG = greenhouse gas; HFCs = hydrofluorocarbons; kt CO_2-e = kilotonnes carbon dioxide equivalent; NA = not applicable; NE = not estimated; N_2O = nitrous oxide; PFCs = perfluorocarbons; SF_6 = sulphur hexafluoride.

CTF Table 4: Reporting on progress

Year[c]	Total emissions excluding LULUCF ($kt CO_2$-e)	Contribution from LULUCF[d] ($kt CO_2$-e)	Quantity of units from market-based mechanisms under the Convention (number of units)	Quantity of units from market-based mechanisms under the Convention ($kt CO_2$-e)	Quantity of units from other market-based mechanisms (number of units)	Quantity of units from other market-based mechanisms ($kt CO_2$-e)
Base year/base period	66,720.16	NA	NA	NA	NA	NA
2013	79,397.17	–9,365.16	NA	NA	NA	NA
2014	80,267.87	–9,538.18	NA	NA	NA	NA
2015	80,155.14	–12,535.32	NA	NA	NA	NA

Note: kt CO_2-e = kilotonnes carbon dioxide equivalent; LULUCF = land use, land-use change and forestry; NA = not applicable.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] For the base year, information reported on the emission reduction target shall include the following: (a) total greenhouse gas (GHG) emissions, excluding emissions and removals from the LULUCF sector; (b) emissions and/or removals from the LULUCF sector based on the accounting approach applied, taking into consideration any relevant decisions of the Conference of the Parties and the activities and/or land that will be accounted for; (c) total GHG emissions, including emissions and removals from the LULUCF sector. For each reported year, information reported on progress made towards the emission reduction targets shall include, in addition to the information noted in paragraphs 9(a–c) of the UNFCCC biennial reporting guidelines for developed country Parties, information on the use of units from market-based mechanisms.

[c] Parties may add additional rows for years other than those specified below.

[d] Information in this column should be consistent with the information reported in table 4(a)I or 4(a)II, as appropriate. The Parties for which all relevant information on the LULUCF contribution is reported in table 1 of this common tabular format can refer to table 1.

CTF Table 4(a)ii: Progress in achievement of the quantified economy-wide emission reduction targets: further information on mitigation actions relevant to the counting of emissions and removals from the land use, land-use change and forestry sector in relation to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Greenhouse gas source and sink activities	Base year	Net emissions/removals[e] (kt CO_2-equivalent) 2013	2014	2015	2016	2017	2018	2019	2020	Total[g]	Accounting parameters[h]	Accounting quantity[i]
A. Article 3.3 activities												
A.1. Afforestation/reforestation		–15,704.07	–15,803.31	–16,001.16						–47,508.55		–47,508.55
Excluded emissions from natural disturbances (5)		NA	NA	NA						NA		NA
Excluded subsequent removals from land subject to natural disturbances (6)		NA	NA	NA						NA		NA
A.2. Deforestation		6,338.92	6,265.13	3,465.84						16,069.89		16,069.89
B. Article 3.4 activities												
B.1. Forest management										–38,604.81		–20,319.02
Net emissions/removals[e]		–13,237.14	–13,261.44	–12,106.23						–38,604.81		
Excluded emissions from natural disturbances (5)		NA	NA	NA						NA		NA
Excluded subsequent removals from land subject to natural disturbances (6)		NA	NA	NA						NA		NA
Any debits from newly established forest (CEF-ne) (7), (8)												
Forest management reference level (FMRL) (9)											11,150.00	
Technical corrections to FMRL (10)											–17,245.26	
Forest management cap[l]											2,335.21	–2,335.21
B.2. Cropland management (if elected)		NE, NA	NE, NA	NE, NA						NE, NA		NE ,NA
B.3. Grazing land management (if elected)		NE, NA	NE, NA	NE ,NA						NE, NA		NE, NA
B.4. Revegetation (if elected)		NE	NE	NE						NE		NE
B.5. Wetland drainage and rewetting (if elected)		NE	NE	NE						NE		NE

Note: 1 kt CO_2 eq equals 1 Gg CO_2 eq. Abbreviations: CRF = common reporting format, LULUCF = land use, land-use change and forestry, NA = not applicable, NE = not estimated.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] Developed country Parties with a quantified economy-wide emission reduction target as communicated to the secretariat and contained in document FCCC/SB/2011/INF.1/Rev.1 or any update to that document, that are Parties to the Kyoto Protocol, may use table 4(a)II for reporting of accounting quantities if LULUCF is contributing to the attainment of that target.

[c] Parties can include references to the relevant parts of the national inventory report, where accounting methodologies regarding LULUCF are further described in the documentation box or in the biennial reports.

[d] Net emissions and removals in the Party's base year, as established by decision 9/CP.2.

[e] All values are reported in the information table on accounting for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, of the CRF for the relevant inventory year as reported in the current submission and are automatically entered in this table.

[f] Additional columns for relevant years should be added, if applicable.

[g] Cumulative net emissions and removals for all years of the commitment period reported in the current submission.

[h] The values in the cells '3.3 offset' and 'Forest management cap' are absolute values.

[i] The accounting quantity is the total quantity of units to be added to or subtracted from a Party's assigned amount for a particular activity in accordance with the provisions of Article 7, paragraph 4, of the Kyoto Protocol.

[j] In accordance with paragraph 4 of the annex to decision 16/CMP.1, debits resulting from harvesting during the first commitment period following afforestation and reforestation since 1990 shall not be greater than the credits accounted for on that unit of land.

[k] In accordance with paragraph 10 of the annex to decision 16/CMP.1, for the first commitment period a Party included in Annex I that incurs a net source of emissions under the provisions of Article 3 paragraph 3, may account for anthropogenic greenhouse gas emissions by sources and removals by sinks in areas under forest management under Article 3, paragraph 4, up to a level that is equal to the net source of emissions under the provisions of Article 3, paragraph 3, but not greater than 9.0 megatonnes of carbon times five, if the total anthropogenic greenhouse gas emissions by sources and removals by sinks in the managed forest since 1990 is equal to, or larger than, the net source of emissions incurred under Article 3, paragraph 3.

[l] In accordance with paragraph 11 of the annex to decision 16/CMP.1, for the first commitment period of the Kyoto Protocol only, additions to and subtractions from the assigned amount of a Party resulting from Forest management under Article 3, paragraph 4, after the application of paragraph 10 of the annex to decision 16/CMP.1 and resulting from forest management project activities undertaken under Article 6, shall not exceed the value inscribed in the appendix of the annex to decision 16/CMP.1, times five.

CTF Table 4(b): Reporting on progress

	Quantity of units	kt CO_2-e
2013		
Kyoto Protocol Units[d]		
AAUs	0.00	0.00
ERUs	0.00	0.00
CERs	0.00	0.00
tCERs	0.00	0.00
lCERs	0.00	0.00
Units from market-based mechanisms under the Convention[d, e]		
Units from other market-based mechanisms[d, e]		
Total		
2014		
Kyoto Protocol Units[d]		
AAUs	0.00	0.00
ERUs	0.00	0.00
CERs	0.00	0.00
tCERs	0.00	0.00
lCERs	0.00	0.00
Units from market-based mechanisms under the Convention[d, e]		
Units from other market-based mechanisms[d, e]		
Total		
2015		
Kyoto Protocol Units[d]		
AAUs	0.00	0.00
ERUs	0.00	0.00
CERs	0.00	0.00
tCERs	0.00	0.00
lCERs	0.00	0.00
Units from market-based mechanisms under the Convention [d, e]		
Units from other market-based mechanisms [d, e]		
Total		

Note: New Zealand understands 'surrender' to mean retire. New Zealand retired international units in 2015 to fulfil its emissions target for the First Commitment Period of the Kyoto Protocol. However, no units have been retired or used to meet New Zealand's current (2013–2020) economy-wide target. AAUs = assigned amount units; CERs = certified emission reductions; ERUs = emission reduction units; kt CO_2-e = kilotonnes carbon dioxide equivalent; lCERs = long-term certified emission reductions; tCERs = temporary certified emission reductions.

[a] Reporting by a developed country Party on the information specified in the common tabular format does not prejudge the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

[b] For each reported year, information reported on progress made towards the emission reduction target shall include, in addition to the information noted in paragraphs 9(a–c) of the reporting guidelines, on the use of units from market-based mechanisms.

[c] Parties may include this information, as appropriate and if relevant to their target.

[d] Units surrendered by that Party for that year that have not been previously surrendered by that or any other Party.

[e] Additional rows for each market-based mechanism should be added, if applicable.

Chapter IV: Projections

New Zealand uses projections to anticipate future greenhouse gas emissions and removals. New Zealand's projections of emissions are produced by a cross-government technical group led by the Ministry for the Environment. Agricultural emissions and net emissions and removals by forests are projected by the Ministry for Primary Industries. Emissions from stationary energy and transport, and carbon dioxide emissions from industrial processes are projected by the Ministry of Business, Innovation and Employment. Projections of emissions from the waste sector and emissions of fluorinated gases are completed by the Ministry for the Environment.

The projections of greenhouse gas emissions and removals cover the following sectors:

- energy
- transportation
- industrial processes and product use (IPPU)
- agriculture
- land use, land-use change and forestry (LULUCF)
- waste.

New Zealand's 2020 emission reduction target

New Zealand chose to take its 2020 emission reduction targets under the United Nations Framework Convention on Climate Change (UNFCCC) and not under the Kyoto Protocol, as it did for the 2008 to 2012 first commitment period (CP1).

However, New Zealand continues to apply the Kyoto Protocol framework of rules in tracking progress towards its target. New Zealand's unconditional target is to reduce emissions to 5 per cent below 1990 levels by 2020.

New Zealand tracks its progress towards this target by periodically producing a net position report to provide information on New Zealand's progress towards its 2020 emission reduction target.[30] The report takes into account New Zealand's historic and projected emissions and removals from 2013 to 2020, and units held by the Government that can be used to meet its target. The net position update calculates the unit balance relative to its 2020 target (ie, in either a surplus or deficit).

The latest net position update produced in May 2017 showed that New Zealand is projected to meet its unconditional target to reduce emissions to 5 per cent below 1990 levels by 2020 with a surplus of 97.7 million units.

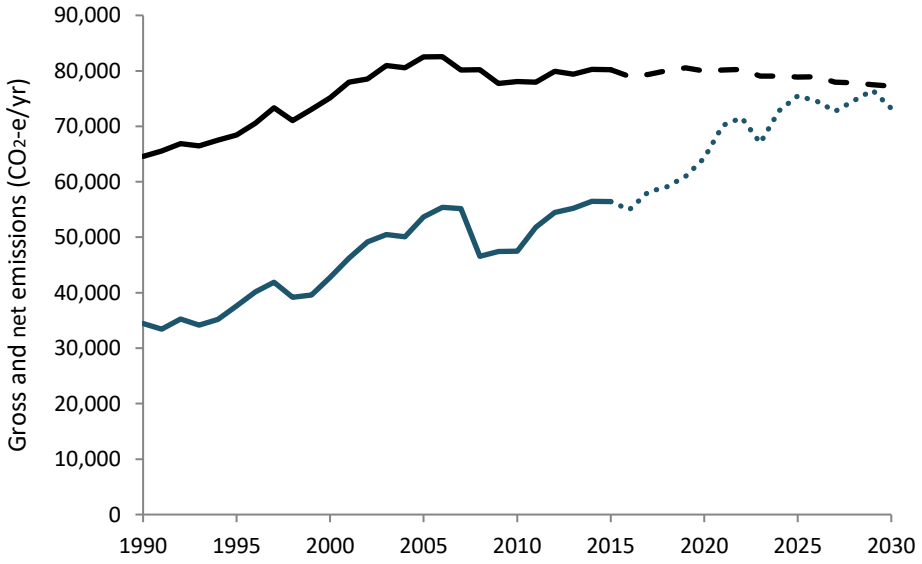
[30] This projection report is available at: www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/latest-2020-net-position.

Projections under the UNFCCC

New Zealand uses projections to anticipate future emissions.[31] Projections of emissions and removals are useful but inherently uncertain. Economic variables, such as commodity and oil prices, the assumed carbon price, the assumed rate of afforestation and deforestation and the harvest age of forests, have significant effects on projected emissions and removals. Seasonal changes, especially variation in rainfall, can affect both energy and agriculture emissions. There is also uncertainty in the methodology to estimate emissions from biological sources such as agriculture and forestry. For a full table of assumptions used in the projections modelling see CTF table 5.

Based on current data, with measures projections out to 2030 show that New Zealand's gross emissions are projected to decrease to 77,239 kt CO_2-e in 2030 (19.6 per cent above 1990 levels or 3.7 per cent below 2015 levels). New Zealand's net emissions to 2030 are projected to increase to 77,239 kt CO_2-e (19.6 per cent above 1990 levels or 3.7 per cent below 2015 levels). Given the influence of forests on New Zealand's emissions, at any given point in time, net emissions will be strongly influenced by the planting and harvesting cycles of New Zealand's planted forest in the LULUCF sector (figure 4.1).

Figure 4.1: New Zealand's historical (solid lines) and projected (dotted lines) gross and net emissions from 1990–2030 under the UNFCCC (referred to as the 'with measures scenario')



Note: CO_2-e/yr = carbon dioxide equivalent per year. The black lines represent gross emissions, while the blue lines represent net emissions.

Plantation forestry removals are expected to gradually decrease out to 2030, reducing the impact that these forests have as an overall net sink. This is because forests planted in the late 1980s and early 1990s will be harvested for timber production around this time, as part of the managed forestry cycle. The forestry sector is expected to revert to a net carbon dioxide sink,

[31] Emissions projections in national communications reports are calculated using reporting rules under the UNFCCC, as required by reporting guidelines. In contrast, New Zealand's Kyoto Protocol projections, and emission reduction targets, are based on emissions calculated under the Kyoto Protocol framework of rules. As a result, the projections here are not strictly relevant to New Zealand's emission reduction targets.

once the forests are replanted and the trees have matured enough to absorb enough carbon dioxide to act as a net sink. These projections assume that New Zealand's tall natural forests are in a steady state, with respect to carbon dioxide emissions (ie, neither a sink nor a source), and regenerating natural forests are a steady sink with respect to carbon dioxide emissions.

Comparing New Zealand's projected net emissions 'with measures' and 'without measures', as shown in figure 4.2, can be used to demonstrate the impact of some, but not all, of New Zealand's policies and measures.[32] Unforeseen technological disruption may also affect greenhouse gas emissions. For example, New Zealand's investment in agricultural research may contribute to a reduction in domestic emissions and lend a potential indirect contribution towards reducing global agriculture emissions. However, the benefits of such contributions cannot be predicted and, as such, are not included in the emissions estimates. In total, the current projections show that the impact of New Zealand's policies and measures are estimated to reduce gas emissions by 31.0 million tonnes carbon dioxide equivalent (Mt CO_2-e) between 1990 and 2015 and by 113.2 Mt CO_2-e from 2016 to 2030.

Projected greenhouse gas emissions and removals, 'with measures'

New Zealand's gross emissions under the with measures scenario (excluding net emissions and removals from the LULUCF sector) are projected to rise to:

- 79,958 kt CO_2-e in 2020 (23.8 per cent above 1990 levels or 0.3 per cent below 2015 levels)
- 77,239 kt CO_2-e in 2030 (19.6 per cent above 1990 levels or 3.7 per cent below 2015 levels).

New Zealand's net emissions (including emissions and removals from the LULUCF sector) are projected to rise to:

- 64,264 kt CO_2-e in 2020 (86.5 per cent above 1990 levels or 13.9 per cent above 2015 levels)
- 73,196 kt CO_2-e in 2030 (112.5 per cent above 1990 levels or 29.7 per cent above 2015 levels).

Time series data for projected greenhouse gas emissions and removals under the 'with measures' scenario is presented in CTF table 6a.

Projected greenhouse gas emissions and removals, 'without measures'

New Zealand's gross emissions (excluding LULUCF) from the 'without measures' scenario are projected to be:

- 81,682 kt CO_2-e in 2020 (an absolute difference of 1,724 kt CO_2-e or 2.2 per cent greater than the 'with measures' scenario)
- 81,792 kt CO_2-e in 2030 (an absolute difference of 4,554 kt CO_2-e or 5.9 per cent greater than the 'with measures' scenario)

Total net emissions (ie, including LULUCF emissions/removals) from the 'without measures' scenario are projected to be:

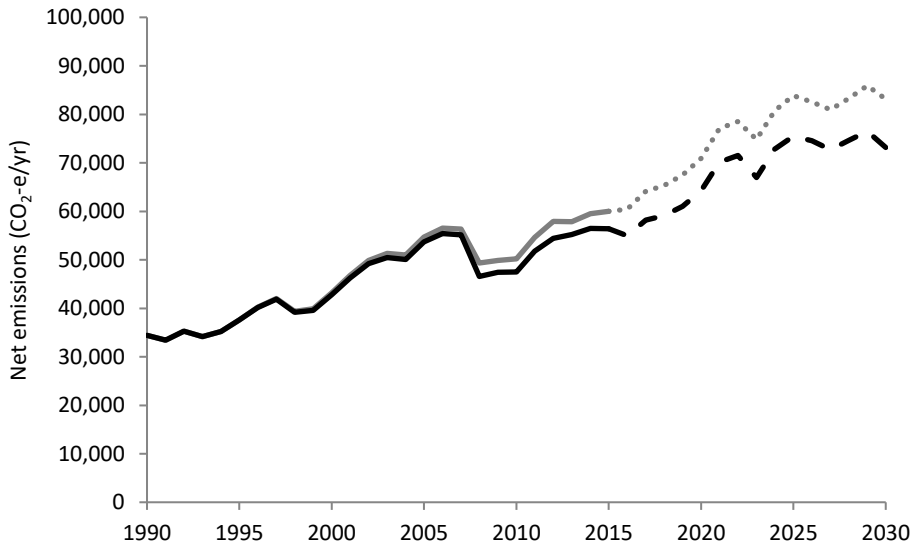
---

[32] Government policies and measures on energy efficiency assume the same energy efficiency trends for both the 'with measures' and 'without measures' scenarios.

- 70,954 kt CO_2-e in 2020 (an absolute difference of 6,690 kt CO_2-e or 10.4 per cent greater than the 'with measures' scenario)
- 83,142 kt CO_2-e in 2030 (an absolute difference of 9,946 kt CO_2-e or 13.6 per cent greater than the 'with measures' scenario).

Time series data for projected greenhouse gas emissions and removals under the 'without measures' scenario is presented in CTF table 6b.

Figure 4.2: New Zealand's historical (solid lines) and projected (dashed lines) 'with measures' and 'without measures' scenarios for net emissions



Note: kt CO_2-e/yr = kilotonnes carbon dioxide equivalent per year. The black line represents net emissions from the 'with measures' scenario, while the grey line represents the 'without measures' scenario.

For more information on projections and the effect of policies and measures see chapter 5 of *New Zealand's Seventh National Communication*. For more information on information on updated greenhouse gas projections for the 'with measures' and the 'without measures scenario please refer to CTF Tables 6a and 6b, respectively. Key variables and assumptions are available in CTF Table 5.

Chapter 4 of the *Seventh National Communication* contains detailed information on the full suite of climate change related policies and measures implemented in New Zealand. There have been changes in the methodologies used to project greenhouse gas emissions since the *Sixth National Communication*. Detailed information on both of these projections and on the methodologies used to model projections presented in this section can be found in chapter 5 of the *Seventh National Communication*.

CTF Table 5: Summary of key variables and assumptions used in the projections analysis

		Historical							Projected		
Key underlying assumptions	**Unit**	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2020**	**2025**	**2030**
Population	million	3.46	3.68	3.86	4.14	4.35	4.6	4.69	4.98	5.25	5.47
GDP	real 09/10 $NZ billion	105.79	122.45	141.79	171.48	180.97	206.67	225.53	246.78	271.32	296.3
Exchange rate*	(NZ$/US$)	0.62	0.55	0.46	0.7	0.72	0.7	0.65	0.65	0.66	0.66
Oil price	real 2014 US$/barrel	40.22	27.35	41.84	69.03	84.41	47.96	34.71	55.16	84.08	113
Gas supply from new discovery	PJ/year	0	0	0	0	0	0	0	0	81.47	140.35
Carbon price for non-forestry projections	$/t CO_2-eq	0	0	0	0	19.5	15.21	17.15	19.57	22.58	25
Carbon price for forestry projections (average value from the mid scenario range of $12.5–25/t CO_2-e)	$/t CO_2-eq						18.75	18.75	18.75	18.75	18.75
Afforestation area (from mid scenario)	ha/year	11,793	55,062	24,901	4,399	6,176	1,965	5,000	7,000	12,500	15,000
Deforestation area (from mid scenario; Post-1989)	ha/year	0	0	0	2,358	1,404	646	1,000	2,250	2,250	2,250
Deforestation age (from mid scenario; Post 1989)	years	0	0	0	11	12	24	24	28	30	30
Deforestation area (from mid scenario; Pre-1990)	ha/year	0	0	2,031	11,210	6,176	3,146	2,500	1,200	1,200	1,200
Deforestation age (from mid scenario; Pre-1990)	years	0	0	0	28	24	28	28	28	28	28
Harvest area (from mid scenario; Post 1989)	ha/year	0	0	0	200	1,513	4,562	13,023	14,901	42,837	23,119
Harvest age (from mid scenario; Post 1989)	years	0	0	0	12	17	24	24	28	30	30
Harvest area (from mid scenario; Pre 1990)	ha/year	19,427	29,275	35,530	27,056	35,650	40,547	42,382	49,712	37,756	33,876
Harvest age (from mid scenario; Pre-1990)	years	28	28	28	28	28	29	30	35	33	31

Key underlying assumptions	Unit	Historical							Projected		
		1990	1995	2000	2005	2010	2015	2016	2020	2025	2030
Total solid waste disposal	kt/yr	7,561.56	8,012.06	8,427.77	9,081.96	8,714.15	9,938.58	9,968.29	10,405.51	10,952.04	11,498.56
Milk solids	NZ cents/kg (2010 prices)	605.38	516.43	560.74	566.78	631.5	407.76	381.61	590.69	586.41	586.41
Lamb	NZ cents/kg (2010 prices)	428.58	362.03	461.39	481.22	467.27	453.47	431.2	460.15	460.77	460.77
Prime beef	NZ cents/kg (2010 prices)	508.51	367.65	452.54	379.92	335.3	423.08	453.94	410.4	412.08	412.08
Days of soil moisture deficit for deer	days	67.23	67.02	53.33	57.73	91.27	87.93	103.3	78.18	78.16	78.16
Days of soil moisture deficit for beef cattle	days	59.5	59.95	55.86	55.05	89.11	88.6	99.4	74.95	74.95	74.95
Days of soil moisture deficit for dairy cattle	days	52.01	48.26	51.12	64.38	81.13	77.67	85.1	67.19	67.19	67.19
Days of soil moisture deficit for sheep	days	73.89	69.41	57.91	60.63	89.68	93.29	109.6	82.01	82.01	82.01
Fleet size (number of vehicles)											
Light passenger vehicles	thousands						2,965.57	3,045.13	3,299.44	3,512.32	3,637.56
Light commercial vehicles	thousands						496.73	505.19	549.57	587.96	614.88
Motorcycles	thousands						148.4	159.88	170.81	178.59	181.99
Heavy commercial vehicles	thousands						156.45	162.45	174.46	184.57	189.75
Buses	thousands						9.59	10.4	12.39	14.63	16.79
Engine technology (share of fleet)											
Light vehicles											
Internal combustion engines	%						99.9	99.9	99	94.3	85
Electric and plug-in	%						0.1	0.1	1	5.7	15
Heavy vehicles											
Internal combustion engines	%						100	100	99.9	99.5	98
Electric and plug-in	%						0	0	0.1	0.5	2

Key underlying assumptions	Unit	Historical							Projected		
		1990	1995	2000	2005	2010	2015	2016	2020	2025	2030
Energy intensity											
Light petrol vehicles	litres/km						0.1	0.1	0.09	0.09	0.08
Light diesel vehicles	litres/km						0.11	0.11	0.1	0.1	0.09
Heavy commercial vehicles	litres/km						0.41	0.41	0.41	0.41	0.41
Buses	litres/km						0.37	0.36	0.34	0.32	0.3

Note: GDP = gross domestic product; ha = hectares; kg = kilogram; km = kilometre; kt/yr = kilotonnes per year; PJ = petajoule; t CO_2-e = tonnes carbon dioxide equivalent.

*Fluctuations in the exchange rate are expected, and it is assumed that the exchange rate falls from current levels to the long run exchange rate of 0.65 NZ$/US$.

CTF Table 6(a): Information on updated greenhouse gas projections (with measures)

GHG emissions projections	Unit	GHG emissions and removals							With measures	
		Base year	1990	1995	2000	2005	2010	2015	2020	2030
Sector										
Energy	kt CO_2 eq	14,983.58	14,983.58	14,910.52	17,578.68	20,672.30	18,034.44	17,693.32	16,418.49	14,323.76
Transport	kt CO_2 eq	8,764.91	8,764.91	10,959.28	12,423.31	13,901.51	14,150.11	14,761.86	15,303.15	15,014.20
Industry/industrial processes	kt CO_2 eq	3,584.36	3,584.36	3,209.34	3,462.02	4,112.67	4,655.46	5,279.68	5,487.23	6,185.35
Agriculture	kt CO_2 eq	33,122.91	33,122.91	34,983.73	37,067.47	39,114.55	36,861.67	38,419.63	37,888.45	37,736.83
Forestry/LULUCF	kt CO_2 eq	–30,122.39	–30,122.39	–30,851.81	–32,368.35	–28,816.92	–30,614.21	–23,782.63	–15,694.24	–4,042.79
Waste management/waste[1]	kt CO_2 eq	4,118.07	4,118.07	4,384.79	4,611.21	4,692.66	4,375.42	4,051.84	3,976.46	3,978.46
Other sectors										
Gases										
CO_2 emissions including net CO_2 from LULUCF	kt CO_2 eq	–4,964.09	–4,964.09	–3,008.72	–297.12	8,512.04	4,142.31	11,947.43	19,585.27	28,019.81
CO_2 emissions excluding net CO_2 from LULUCF	kt CO_2 eq	25,428.64	25,428.64	28,151.65	32,358.64	37,642.41	35,017.74	35,911.43	35,466.68	32,249.95
CH_4 emissions including CH_4 from LULUCF	kt CO_2 eq	32,615.42	32,615.42	33,708.89	35,383.73	36,006.97	34,156.95	34,322.45	34,238.06	33,978.25
CH_4 emissions excluding CH_4 from LULUCF	kt CO_2 eq	32,522.22	32,522.22	33,597.14	35,296.98	35,868.58	34,046.71	34,243.10	34,158.80	33,899.02
N_2O emissions including N_2O from LULUCF	kt CO_2 eq	5,870.20	5,870.20	6,663.65	7,353.59	8,324.17	7,933.54	8,553.88	8,479.69	8,465.59
N_2O emissions excluding N_2O from LULUCF	kt CO_2 eq	5,693.06	5,693.06	6,466.83	7,152.93	8,149.12	7,782.56	8,451.85	8,371.77	8,357.47
HFCs	kt CO_2 eq	0.00	0.00	57.87	246.20	738.25	1,158.82	1,523.50	1,914.54	2,697.34
PFCs	kt CO_2 eq	909.95	909.95	149.75	67.61	69.38	47.41	58.59	23.87	12.18
SF_6	kt CO_2 eq	19.97	19.97	24.42	20.34	25.96	23.85	17.85	22.64	22.64
NF_3	kt CO_2 eq	NA	NA	NA	NA	NA	NA	NA	NA	NA

GHG emissions projections	Unit	Base year	GHG emissions and removals 1990	1995	2000	2005	2010	2015	With measures 2020	2030
Other gases										
Total with LULUCF	kt CO_2 eq	34,451.45	34,451.45	37,595.84	42,774.35	53,676.77	47,462.89	56,423.69	64,264.06	73,195.82
Total without LULUCF	kt CO_2 eq	64,573.84	64,573.84	68,447.65	75,142.70	82,493.69	78,077.10	80,206.33	79,958.30	77,238.61

[1] The 2015 value for emissions from managed solid waste has been updated since *New Zealand's Greenhouse Gas Inventory 1990–2015*.

[2] Methane emissions reported in New Zealand's *Seventh National Communication* and *Third Biennial Report* from 1990–2014 do not equal the amount of methane gas emissions reported in *New Zealand's Greenhouse Gas Inventory 1990–2015* due to rounding to 2 decimal places.

CTF Table 6(b): Information on updated greenhouse gas projections (without measures)

GHG emissions projections	Unit	Base year	GHG emissions and removals 1990	1995	2000	2005	2010	2015	Without measures 2020	2030
Sector										
Energy	kt CO_2 eq	14,983.58	14,983.58	14,910.52	17,578.68	20,689.40	18,202.32	18,266.75	16,949.89	15,924.63
Transport	kt CO_2 eq	8,764.91	8,764.91	10,959.28	12,423.31	13,901.51	14,153.01	14,765.36	16,289.51	15,136.82
Industry/industrial processes	kt CO_2 eq	3,584.36	3,584.36	3,209.34	3,462.02	4,112.67	4,655.46	5,279.68	5,487.23	6,185.35
Agriculture	kt CO_2 eq	33,122.91	33,122.91	34,983.73	37,067.47	39,114.55	36,861.67	38,419.63	38,242.09	39,561.31
Forestry/LULUCF	kt CO_2 eq	–30,122.39	–30,122.39	–30,840.07	–31,944.66	–27,874.18	–28,363.43	–21,320.87	–10,728.37	1,349.81
Waste management/waste	kt CO_2 eq	4,118.07	4,118.07	4,384.79	4,611.21	4,714.48	4,709.12	4,589.44	4,713.57	4,984.13
Other sectors										
Gases										
CO_2 emissions including net CO_2 from LULUCF	kt CO_2 eq	–4,964.09	–4,964.09	–2,996.99	126.57	9,470.97	6,551.19	14,952.57	25,128.92	35,035.27
CO_2 emissions excluding net CO_2 from LULUCF	kt CO_2 eq	25,428.64	25,428.64	28,151.65	32,358.64	37,658.60	35,175.84	36,454.81	36,044.46	33,872.81

GHG emissions projections	Unit	GHG emissions and removals							Without measures	
		Base year	1990	1995	2000	2005	2010	2015	2020	2030
CH_4 emissions including CH_4 from LULUCF	kt CO_2 eq	32,615.42	32,615.42	33,708.89	35,383.73	36,029.59	34,502.31	34,890.07	35,292.89	36,482.61
CH_4 emissions excluding CH_4 from LULUCF	kt CO_2 eq	32,522.22	32,522.22	33,597.14	35,296.98	35,891.19	34,392.07	34,810.72	35,213.63	36,403.38
N_2O emissions including N_2O from LULUCF	kt CO_2 eq	5,870.20	5,870.20	6,663.65	7,353.59	8,324.28	7,934.57	8,557.41	8,571.06	8,892.01
N_2O emissions excluding N_2O from LULUCF	kt CO_2 eq	5,693.06	5,693.06	6,466.83	7,152.93	8,149.23	7,783.59	8,455.39	8,463.15	8,783.90
HFCs	kt CO_2 eq	0.00	0.00	57.87	246.20	738.25	1,158.82	1,523.50	1,914.54	2,697.34
PFCs	kt CO_2 eq	909.95	909.95	149.75	67.61	69.38	47.41	58.59	23.87	12.18
SF_6	kt CO_2 eq	19.97	19.97	24.42	20.34	25.96	23.85	17.85	22.64	22.64
NF_3	kt CO_2 eq	NA	NA	NA	NA	NA	NA	NA	NA	NA
Other gases										
Total with LULUCF	kt CO_2 eq	34,451.45	34,451.45	37,607.58	43,198.03	54,658.43	50,218.15	59,999.99	70,953.92	83,142.05
Total without LULUCF	kt CO_2 eq	64,573.84	64,573.84	68,447.65	75,142.70	82,532.61	78,581.58	81,320.86	81,682.29	81,792.25

Note: CO_2 = carbon dioxide; CH_4 = methane; GHG = greenhouse gas; HFCs = hydrofluorocarbons; kt CO_2 eq = kilotonnes carbon dioxide equivalent; LULUCF = land use, land-use change and forestry; N_2O = nitrous oxide; NA = not applicable; NF_3 = nitrogen trifluoride; PFCs = perfluorocarbons; SF_6 = sulphur hexafluoride.

Chapter V: Provision of financial, technological and capacity building support to developing countries

Key developments

Since the *Second Biennial Report*, New Zealand has contributed approximately NZ$239.08 million in climate-related support for developing countries. New Zealand's contribution is an increase of approximately NZ$47.09 million, compared with the previous reporting period.

New Zealand's climate-related support is building stronger and more resilient infrastructure, strengthening disaster preparedness and supporting low-carbon economic growth, including through its significant contribution to improving access to affordable, reliable and clean energy. New Zealand is also supporting low-emissions agricultural development, including through the Global Research Alliance on Agricultural Greenhouse Gases.

New Zealand's co-hosting of the 2016 Pacific Energy Conference with the European Union enabled it to mobilise finance at scale: with donors committing over NZ$1 billion to renewable energy projects in the Pacific out to 2024.

Due to the challenges Pacific Island countries face in accessing finance from multilateral funds such as the Green Climate Fund, New Zealand launched a Technical Assistance for Pacific Access programme in early 2016. Through this programme New Zealand is supporting national capacity-building workshops and providing targeted technical assistance with preparing project proposals. More broadly, much of New Zealand's climate-related support has both capacity building and technology transfer aspects.

New Zealand's international support for renewable energy activities in the Pacific, Asia and Africa include both the transfer of technologies and the building of local capacity to better manage renewable energy sources. Additionally, New Zealand has undertaken a number of dedicated capacity building activities aimed at strengthening the voice of Pacific Island countries in climate change negotiations, upskilling Pacific Island countries to develop their Intended Nationally Determined Contributions and support to the United Nations Framework Convention on Climate Change (UNFCCC) including for enhancing the implementation of national greenhouse gas inventories by developing country Parties. For clarity, this section uses the Organisation for Economic Co-operation and Development's (OECD's) developing evaluation capacity (DAC) definition of capacity building.

Introduction

New Zealand remains committed to supporting climate change action in developing countries, with particular areas of focus being the Pacific region, renewable energy, agriculture and disaster risk reduction and management.

This chapter reports on the financial, technological and capacity building support New Zealand has provided to developing countries for climate change action from 2015 to 2016 inclusive

since the *Second Biennial Report.* It covers support provided through multilateral, regional and bilateral channels, as well as specific resources provided for mitigation, adaptation, technology transfer and capacity building. It should also be read alongside New Zealand's *Seventh National Communication*, which covers the 2013–2016 period.

During the reporting period, New Zealand has contributed approximately NZ$239.08 million in financial assistance for climate change outcomes across the following components:

- contributions to a range of multilateral organisations and programmes with a strategic focus on climate change,[33] including special funds under the UNFCCC – total funding of NZ$131.56 million (see CTF table 7a)
- contributions to the operating entities of the Financial Mechanism of the UNFCCC (Green Climate Fund (GCF) and the Global Environment Facility (GEF)) – total funding of NZ$6.7 million
- funding to regional organisations and activities with a core focus on climate change[34] – total funding of NZ$21.39 million
- support for bilateral climate change related assistance delivered through the New Zealand Aid Programme – total funding of NZ$107.52 million (see CTF table 7b).

Overall, New Zealand's contribution is an increase of approximately NZ$47.09 million, compared with the previous reporting period.

Across these components, New Zealand made and delivered on various undertakings over the 2015–2016 period to continue to provide climate-related financial support.

- At the September 2013 Pacific Islands Forum, New Zealand's Prime Minister announced an intention to provide NZ$80 million in climate-related support over the following three years. This figure was significantly exceeded, with total climate-related support expenditure over the 2015–2016 period totalling NZ$190 million.
- At the 2015 UNFCCC Conference of the Parties (COP21), New Zealand committed to providing up to NZ$200 million in climate-related support over the four-year period ending in 2019. New Zealand is on track to deliver on this commitment.

Post-2019, New Zealand is committed to increasing climate finance levels beyond those in place at present This funding will come from a range of public and private sources, with the majority of future climate finance contributions to be determined through future budget cycles. The forthcoming GEF and GCF replenishment cycles will form part of this process.

More broadly, New Zealand remains committed to the global goal of jointly mobilising US$100 billion per year by 2020 from a variety of sources in the context of meaningful mitigation actions by developing countries and transparency on implementation.

[33] These contributions represent the full amounts provided to the organisations for the full range of activities covered by their programmes, which include climate change mitigation and adaptation.

[34] Ibid.

New and additional support

New Zealand's approach to determining how financial resources are new and additional has not changed since last articulated in its *Second Biennial Report*. New Zealand's practical approach has been to report all climate-related assistance provided during the reporting period. Doing so is the most transparent and appropriate way of communicating new resources provided.

New Zealand's view remains that it is not effective to try to separate climate-related support from other official development assistance (ODA). In practical terms, any climate-related support provided over the reporting period that meets agreed ODA definitions (ie, with a strong concessional element and a focus on economic development and welfare of developing countries as its main objective) is included in this report.

New Zealand's climate-related support is an increasing part of New Zealand's growing aid budget. For the 2015–2016 reporting period, it is estimated that approximately 22 per cent of the ODA managed by the New Zealand Aid Programme had a climate component.

National approach to tracking and reporting provision of support

New Zealand is committed to regular and transparent reporting of its climate-related support and to finding ways to further improve the tracking of its climate-related financial flows. Tracking and monitoring climate finance enables both donor and recipient countries to direct support to areas or sectors that offer the greatest mitigation and adaptation potential, thereby achieving the most effective outcomes and facilitating further climate finance and investment flows.

New Zealand's aid programme has systems in place to track, measure and record climate-related assistance provided to developing countries. In addition, New Zealand has work under way that will help it to better capture and report on the results of its climate-related support in the future.

The aid programme's Climate Change Operational Policy details how support for climate change is to be delivered and describes how that support is to be recorded and quantified in internal systems. The policy requires activities and programmes to be assessed for climate change risks, and opportunities explored to support adaptation to and mitigation of climate change. The aid programme uses the OECD Development Assistance Committee (DAC) 'Rio' markers as a basis for tracking development assistance with climate change adaptation and mitigation outcomes.

While the DAC Rio markers capture the thematic objectives of each activity, they do not attempt to quantify expenditure towards these objectives. New Zealand has therefore initiated a system to quantify its climate-related support from the aid programme, building on the DAC Rio markers.

This system enables climate-related expenditure to be quantified and recorded in the aid programme's climate change inventory, according to the specific classifications and moderation weightings given in table 5.1.

Table 5.1: Classifications and moderation weightings for quantifying and recording climate-related expenditure

Classification	Where addressing climate change is…	Financial information recorded in the climate change inventory
Principal	… one of the main outcomes of the activity Addressing climate change risks or opportunities is fundamental to the design of the activity. The activity includes climate change as an important outcome. Climate change is explicitly addressed through specific outputs.	100% of the activity value for the financial year
Significant	…one of the outcomes of the activity Addressing climate change risks or opportunities is an important but not the principal reason for undertaking the activity. Climate change is explicitly addressed as part of outputs in the activity design – these do more than simply avoid a potential negative impact.	30% of the activity value for the financial year unless: • A more accurate figure is known or • A different default figure is specified for the particular activity type
Not targeted	… not an outcome of the activity Climate change opportunities and risks have been assessed but will not be significantly addressed through any of the outputs in the Results Framework.	0% of the activity value for the financial year

In addition to the criteria in table 5.1, some activities supported by the aid programme have specific funding allocations. Table 5.2 provides further guidance on the application of the climate change markers for those activities.

Table 5.2: Guidance on the application of the climate change markers

Activity	Description	Marker and classification	Weighting
Disaster risk reduction and management	The activity is driven by a prime concern for extreme weather events.	Adaptation: Principal	100%
	The activity is driven by a prime concern for seismic events (earthquakes, tsunamis) but where extreme weather events occur.	Adaptation: Significant	50%
Renewable energy and energy efficiency	Any activity dealing with renewable energy and/or energy efficiency whether the prime concern is energy security, economic growth, climate change or any combination.	Mitigation: Principal	100%
Energy upgrading	Energy upgrading activities, where the outcome of the activity is safer access to energy supplies in the presence of extreme weather events, can potentially be marked significant.	Adaptation: Significant	30%

New Zealand reports here on bilateral, regional and multilateral financial contributions as follows.

- Reported bilateral contributions include funding from the aid programme for activities where addressing climate change is assessed as being the 'principal' or 'significant' outcome of the activity.
- Reported regional and multilateral contributions include core funding provided to: regional organisations with a core focus on climate change; multilateral agencies for whom climate change is integral to their strategic plans and approaches; and regional organisations conducting activities in the framework of the Global Research Alliance on Agricultural Greenhouse Gases. Except for funding to support Global Research Alliance activities, core funding provided to regional and multilateral organisations is not monitored at a level that tracks specific climate change allocations and actions. As such, some of the figures provided in CTF tables 7a and 7b represent total contributions to multilateral and regional organisations "that Parties cannot specify as being climate-specific". This approach is in keeping with the Guidelines.[35]

For the purposes of this report, 'provided' means funds that have been transferred from the New Zealand Government to a recipient, including any multilateral organisation.

Financial resources

This *Third Biennial Report* reports on all climate-related financial support provided by New Zealand since its *Second Biennial Report* for the purpose of assisting developing countries' mitigation and adaptation efforts. This report also highlights some of the key initiatives that New Zealand has supported.

New Zealand's reporting period covers two calendar years: 2015 and 2016, and funds are reported in New Zealand dollars. The methodology used for calculating currency exchange is the annual average exchange rates, as used by the OECD. The rates used are as follows:

- 2015: USD 1 = NZD 1.4342
- 2016: USD 1 = NZD 1.4365.

New Zealand has adopted the UNFCCC agreed common tabular format from the Biennial Reporting Guidelines (FCCC/CP/2011/9/Add.1) for this *Third Biennial Report*, to ensure transparency in reporting financial data and promote consistency across all financial contributors.

Multilateral support

Global Environment Facility

The GEF is an operating entity of the UNFCCC's Financial Mechanism. The GEF distributes financial assistance associated with the major multilateral agreements on climate change, biodiversity, persistent organic pollutants, ozone-depleting substances and desertification. It also supports activities relating to land degradation and international waters.

---

[35] UNFCCC biennial reporting guidelines for developed country Parties, Annex I, Decision pdf-icon 2/CP.17 (pages 31–35) retrieved from http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=4 (12 October 2017).

CTF table 7a provides details of New Zealand's total contributions to the GEF Trust Fund for the 2015–2016 reporting period, amounting to NZ$3.7 million.[36] The reporting period falls within the sixth replenishment of the GEF Trust Fund (2014–2018), to which New Zealand committed a total of 4 million Special Drawing Rights (SDR), equating to NZ$7.47 million. In addition, in 2016, New Zealand contributed NZ$130,000 to the GEF's Capacity Building Initiative for Transparency (CBIT). Established at COP21, the CBIT will support developing country Parties in meeting enhanced transparency arrangements under the Paris Agreement.

Green Climate Fund

The GCF is an operating entity of the UNFCCC's Financial Mechanism. The GCF was established in 2010 but only became fully operational in 2015. It aims to support a paradigm shift in the global response to climate change, by mobilising funding at scale (including via its Private Sector Facility) to invest in low-emission and climate-resilient development. The GCF has committed to aim for a 50:50 balance between mitigation and adaptation investments, with at least 50 per cent of adaptation funding to go to the most vulnerable countries, including least developed countries (LDCs), small island developing states (SIDS), and African States.

New Zealand contributed NZ$3 million to the initial resource mobilisation of the GCF in May 2015.

Other multilateral support

New Zealand continues to support a range of multilateral organisations and programmes with a strategic focus on climate change, including those with specific programmes related to the implementation of the UNFCCC (see CTF table 7a). This includes, for instance, the World Bank, Asian Development Bank and United Nations Development Programme.

During the reporting period, New Zealand contributed NZ$20,000 to the UNFCCC Trust Fund for Participation to assist developing countries' participation in UNFCCC meetings, and NZ$364,000 to the UNFCCC Trust Fund for Supplementary Activities to: support the international consultation and analysis processes in developing countries; support the implementation of national greenhouse gas inventories by developing country Parties, including training on the use of the 2006 Intergovernmental Panel on Climate Change inventory guidelines; support the implementation of the Cancun Adaptation Framework and the Nairobi work programme on impacts, vulnerability and adaptation to climate change; and support the intersessional workshop on Article 13 of the Paris Agreement (transparency), including for participation by developing country Parties.

Regional support

New Zealand, through the New Zealand Aid Programme, is a major funder of the Pacific regional organisations with a core focus on climate change, as detailed in CTF table 7a. These organisations include:

- the Secretariat of the Pacific Regional Environment Programme (www.sprep.org), which has the lead responsibility for coordinating the region's response to climate change and

[36] Annual contributions represent the combined total of New Zealand's payments to the GEF Trust Fund in the financial year (July to June). GEF projects address six global environmental issues, or focal areas, of which climate change is one.

provides policy and technical support to its Pacific Island members to meet their commitments under the UNFCCC, and to support climate adaptation actions

- the Pacific Community (www.spc.int), which provides assistance to its members in a number of climate-affected sectors such as health, geoscience, agriculture, forestry, water resources, disaster management and energy
- the Pacific Islands Forum Secretariat (www.forumsec.org), which, under the guidance of forum leaders, ministers and officials, conducts high level advocacy and develops policy guidance on climate change and access to climate finance.

New Zealand funding provided to Pacific regional organisations contributes to programmes and projects identified in their strategic plans. This core untagged funding to regional organisations (as for multilateral core contributions) is not monitored at a level that tracks specific climate change activities. The figures provided in CTF tables 7.1 and 7.2 are therefore total allocations to multilateral and regional agencies, rather than estimates of expenditure on specific climate change actions.

The New Zealand Aid Programme is also supporting a range of climate change efforts in the Pacific through several regional initiatives. For example:

- The Secretariat of the Pacific Regional Environment Programme (SPREP)-led New Zealand Pacific Partnership on Ocean Acidification is helping to raise awareness and build resilience in the Pacific. New Zealand is providing NZ$2.1 million over four years (2015 to 2019) to help address this emerging threat, which is also due to the build-up of carbon dioxide in the atmosphere. The partnership is poised to become an even larger Pacific-wide initiative and is likely to form part of a GCF project proposal.
- In partnership with the Pacific Community, New Zealand is supporting a five-year (2014 to 2019), NZ$5 million project to strengthen water security in five low-lying Pacific islands and atolls that are subject to drought and water shortages (Cook Islands, Kiribati, the Republic of the Marshall Islands, Tokelau and Tuvalu). This partnership is working to improve awareness and understanding of water security issues, develop drought management plans and improve water management practices.
- Through its GCF Board seat constituency, New Zealand is working to ensure effective outcomes for the Pacific and other small island developing states. In addition, and following conversations with its partners in the region about their challenges in accessing GCF funding, in early 2016 New Zealand launched the Technical Assistance for Pacific Access programme ('TAPA'). This programme is providing rapid deployment of technical support to develop project proposals from the Pacific. For example, the programme provided engineering assistance in support of Samoa's US$57.7 million flood management project that was approved by the GCF Board in December 2016. New Zealand has also funded national GCF workshops in Kiribati, Niue, Tonga and Tuvalu aimed at bolstering national capacities and understanding of the GCF.
- New Zealand has partnered with the European Union to mobilise finance at scale for renewable energy across the Pacific region (see below under 'Mitigation' for more details).
- New Zealand is keen to build on its experience of adopting a regional approach in renewable energy partnerships to facilitate access to finance flows and to support the Pacific to access climate finance at scale through the GCF and other funding mechanisms. To that end, New Zealand is looking to identify national priorities and develop regional programmes and partnerships to access climate finance in order to strengthen resilient and low carbon development in the Pacific.

- In 2016, New Zealand renewed and expanded its core funding to the International Monetary Fund Pacific Financial Technical Assistance Centre, committing NZ$12 million over five years, part of which is helping Pacific countries to build a stronger foundation from which to apply for climate finance.
- New Zealand supports the development and implementation of regional frameworks, policies and action plans designed to address climate change and disaster risk management. It does this through its membership of the Pacific Islands Forum, which is the Pacific region's intergovernmental and economic policy organisation. As part of this, New Zealand was actively involved in developing the Framework for Resilient Development in the Pacific 2017–2030 (FRDP), which aims to better integrate the agendas of climate change adaptation and disaster risk reduction and brings these two communities together through the Pacific Resilience Partnership.

Over 2015–2016, New Zealand's Ministry for Primary Industries provided NZ$403,000 to a major regional capability building project through the Global Research Alliance on Agricultural Greenhouse Gases' Livestock Research Group work programme. This project aims to identify regionally appropriate low emissions pathways for livestock development in South America, Sub-Saharan Africa and South Asia. The project has enabled participating countries to identify and model cost-effective mitigation options that will significantly improve the efficiency of livestock production and reduce the intensity of enteric methane emissions. Technical input to the project was led by the Food and Agriculture Organization and the New Zealand Agricultural Greenhouse Gas Research Centre, with support from the World Bank. Co-funding was provided by the Climate and Clean Air Coalition (CCAC).

Bilateral support

A large proportion of New Zealand's climate-related support is delivered bilaterally through the New Zealand Aid Programme as grant funding. New Zealand contributed approximately NZ$107.52 million in climate-related bilateral assistance during the 2015–2016 period.

Consistent with the aid programme's 2015–2019 Strategic Plan, New Zealand's climate-related support is primarily delivered as part of activities designed to achieve sustainable, inclusive and resilient development outcomes that meet the aspirations and needs identified by partner countries. New Zealand's climate-related support is building stronger and more resilient infrastructure, strengthening disaster preparedness and supporting low-carbon economic growth, including through its significant contribution to improving access to affordable, reliable and clean energy.

Consistent with the aid programme's geographic focus, New Zealand's climate-related support will continue to have a strong focus on supporting activities in the small island developing states in the Pacific. This region's need for climate-related assistance is great, and New Zealand has the relationships and experience to make a practical difference. In the financial year ending June 2016, approximately NZ$38 million of the NZ$44.6 million of New Zealand's climate-related support was directed to the Pacific. New Zealand also provides climate-related support bilaterally to partner countries in Africa, the Caribbean and to members of the Association of Southeast Asian Nations.

Country partnerships are at the heart of New Zealand's approach to bilateral assistance, with the same true for New Zealand's climate-related support. The Joint Commitments for Development agreed with development partners are based on partner countries' national plans and self-identified needs and priorities.

New Zealand follows a number of development principles when providing climate-related support. These include:

- ownership: encouraging and supporting partner countries to set their own strategies and priorities for responding to the challenge of climate change to create policy certainty, reducing risk and enabling private sector investment
- alignment: aligning support with countries' own identified priorities for climate mitigation and adaptation
- donor harmonisation: partners working together to maximise the effectiveness of support being provided
- results focus: delivering projects that can be tracked and reported to ensure the project is delivering
- transparency: accounting for every dollar spent in the delivery of aid projects.

New Zealand's approach of integrating environment and climate change objectives as cross-cutting issues in all activities managed by the aid programme, where appropriate, is in keeping with international best practice and reduces the burden of reporting on partner countries. Designing development assistance with environment and climate change co-benefits in mind ensures that the development initiatives funded by New Zealand's aid programme support sustainable management of natural assets and address climate change.

Further details of support for country-level mitigation, adaptation, technology transfer and capacity building actions are provided in the relevant sections below, while CTF table 7b contains details of annual financial contributions made from 2015 to 2016 in support of these areas.

Of New Zealand's bilateral support managed and delivered by the aid programme during the reporting period, it is estimated that 39 per cent was directed towards supporting adaptation actions and 51 per cent towards mitigation, with 9 per cent directed to both adaptation and mitigation actions (all percentages are approximate). This is an improvement on the balance between adaptation and mitigation support in New Zealand's *Second Biennial Report*, in which the figures showed that approximately 30 per cent of New Zealand's bilateral support managed and delivered by the aid programme was directed towards supporting adaptation actions and approximately 66 per cent towards mitigation, with 4 per cent directed to both adaptation and mitigation actions. In the short term, a significant part of New Zealand's climate-related support will continue to go towards improving access to affordable, reliable and clean energy. As New Zealand's renewable energy portfolio matures, New Zealand will continue to address the mitigation and adaptation elements of the programme, and will continue working to improve the balance between adaptation and mitigation support.

Mitigation

New Zealand's main areas of engagement in terms of mitigation support have been in the energy and agriculture sectors.

A priority has been supporting renewable energy initiatives through the aid programme. Support for affordable, reliable and clean energy sources is helping partner countries to reduce their carbon emissions, improve energy efficiency and pursue low-carbon development pathways. These measures also have co-benefits, such as increasing energy security, reducing reliance on costly diesel imports and encouraging growth in emerging green industries.

In addition, New Zealand's Pacific Partnership with the European Union aims to mobilise finance flows to drive the uptake of renewable energy in the Pacific at scale. The June 2016 Pacific Energy Conference held in Auckland saw donors commit over NZ$1 billion to renewable energy projects in the Pacific out to 2024, including NZ$100 million from New Zealand. Combined with the 2013 Pacific Energy Summit, which saw over $900 million of investments over 70 projects, these efforts have now mobilised over NZ$2 billion for renewable energy projects in the Pacific. These outcomes highlight the role that developed country partners, such as New Zealand and the European Union, can play in facilitating such a significant outcome by drawing on expertise and relationships in the field to ensure a coordinated, regional approach to renewable energy and energy efficiency. Pacific leaders were connected with finance and private sector expertise to accelerate their national energy plans, and donors were matched with investment ready projects, as outlined in pacific energy country profiles.[37] Delivery of these projects will accelerate progress towards achieving countries' renewable energy targets, which form an important part of their Nationally Determined Contributions submitted under the Paris Agreement.

The aid programme's investment priority of renewable energy offers strong opportunities to increase private sector investment and trade in the Asia–Pacific region. New Zealand recognises the importance of private sector investment in contributing to effective climate outcomes in developing countries, and is committed to better understanding what it can do to help mitigate risks to climate-related investment opportunities in developing countries. Work is under way to identify how to incentivise greater private sector investment in the renewable energy sector, including by reducing real or perceived risks that are barriers to investments (such as payment guarantee systems) and supporting regulatory system improvements.

The dominance of agriculture in New Zealand's emissions profile has motivated New Zealand to use its expertise to help address the 10–12 per cent of global emissions that come from the agriculture sector worldwide. Through the New Zealand Aid Programme, approximately NZ$4.99 million has been invested in climate-related agriculture initiatives over the 2015–2016 period. These initiatives have included a focus on supporting communities to increase their resilience to natural disasters and climate-related weather events, including by introducing new drought-tolerant irrigation technologies. In addition, New Zealand initiated the Global Research Alliance on Agricultural Greenhouse Gases in late 2009, to help decouple emissions from food production, and continues to provide a range of support for these efforts, as outlined elsewhere in this chapter and report.

Adaptation

New Zealand's support for climate change adaptation efforts is primarily designed to reduce the vulnerability of human or natural systems to the impacts of climate change and climate vulnerability, by increasing community resilience and adaptive capacity. This support is largely delivered through bilateral assistance to partner countries, with the aid programme having an investment priority specifically focused on 'resilience'. National and community-level resilience and adaptation actions are implemented within the context of national and regional plans, strategies and frameworks. New Zealand works with recipient countries and regional agencies to help shape and deliver these actions in response to countries' priorities.

[37] Pacific Energy Country Profiles. Retrieved from www.mfat.govt.nz/assets/Peace-Rights-and-Security/Pacific-Energy-Country-Profiles-2016.pdf (12 October 2017).

Small island developing states, such as those in the Pacific, are especially vulnerable to the effects of climate change and extreme weather events. Climate change threatens to reduce resilience and exacerbate existing development and environmental challenges. In response, New Zealand is supporting a range of climate change adaptation projects through the activities of the New Zealand Aid Programme, particularly in the small island developing states of the Pacific.

As summarised in CTF table 7b, examples of key climate change adaptation, disaster risk management and resilience building initiatives supported through the aid programme include projects to strengthen water security and availability; building the resilience of communities and the environment to ocean acidification; the development and maintenance of early warning systems and National Disaster Management offices and related capacity building. New Zealand also continues to support offices in the Cook Islands, Niue, Samoa, Tonga and Tokelau to strengthen their preparedness for and responses to natural disasters, including those relating to climate change.

New Zealand funded the remediation of 'borrow pits' on Tuvalu's main atoll, Funafuti. Excavated during World War II, to provide material to construct the airport runway, the pits over time filled with rubbish, were subject to flooding and became a health hazard. This NZ$10 million remediation project carried out in 2015 has increased the available land area of Funafuti atoll by 6 per cent, by filling the pits to above the king tide and '100 year sea level rise' height (3.64 metres above sea level). The project also involved the repair of the Tegako breach, which is vulnerable to storm surges and extreme weather events.

New Zealand also contributes to disaster risk reduction and resilience building, including work to manage potential impacts of drought associated with El Niño weather events. For example, during the reporting period, New Zealand provided approximately NZ$600,000 for improving Fiji's National Disaster Management Office drought response capability; NZ$1.5 million for New Zealand non-governmental organisations and local implementing partners to support mitigation and preparedness projects across the region in early 2016; and NZ$5 million to tackle the 2015/16 severe drought in Papua New Guinea, including to replace and install more communal water tanks and repair piping to maximise rainwater harvesting in the most badly affected rural areas.

Adaptation and disaster risk reduction are closely related processes that both aim to reduce risk to short-term acute hazards and longer-term chronic hazards. New Zealand therefore also supports greater integration of disaster risk reduction and climate change adaptation. New Zealand participates in the annual United Nations Office for Disaster Risk Reduction Global Platform on Disaster Risk Reduction and has been a strong supporter of the Framework for Resilient Development in the Pacific.

CTF Table 7: Provision of public financial support: summary information in 2015

	New Zealand dollars (millions)						US dollars (millions)					
		Climate specific						Climate specific				
Allocation channel	Core/ general	Mitigation	Adaptation	Cross cutting	Other	Total	Core/ general	Mitigation	Adaptation	Cross cutting	Other	Total
Total contributions through multilateral channels	**59.94**	**0.50**	**0.00**	**3.13**	**0.00**	**63.57**	**41.79**	**0.35**	**0.00**	**2.18**	**0.00**	**44.33**
Multilateral climate change funds	1.81			3.13		**4.94**	1.26			2.18		**3.45**
Other multilateral climate change funds	0.61					**0.61**	0.42			0.00		**0.42**
Multilateral financial institutions, including regional development banks	27.67					**27.67**	19.30					**19.30**
Specialised United Nations bodies	15.50					**15.50**	10.81					**10.81**
Other multilateral	14.35	0.50				**14.85**	10.00	0.35				**10.35**
Total contributions through bilateral, regional and other channels[38]		**28.34**	**25.37**	**4.04**		**57.74**	**0.00**	**19.76**	**17.69**	**2.82**	**0.00**	**40.26**
TOTAL	**59.94**	**28.84**	**25.37**	**7.17**	**0.00**	**121.31**	**41.79**	**20.11**	**17.69**	**5.00**	**0.00**	**84.59**

[38] Figures have been rounded and this may result in a total disagreeing with the total of the individual items as shown in the tables. The impact of this rounding is minor, for example, the rounded total of bilateral adaptation contributions shows in CTF table 7 as 25.37 while the total of the relevant individual items in CTF table 7b amounts to 25.34.

CTF Table 7: Provision of public financial support: summary information in 2016

Allocation channel	New Zealand dollars (millions) Climate specific						US dollars (millions) Climate specific					
	Core/ general	Mitigation	Adaptation	Cross cutting	Other	Total	Core/ general	Mitigation	Adaptation	Cross-cutting	Other	Total
Total contributions through multilateral channels:	**67.21**	**0.00**	**0.00**	**0.78**	**0.00**	**67.99**	**46.79**	**0.00**	**0.00**	**0.54**	**0.00**	**47.33**
Multilateral climate change funds	1.76			0.38		**2.14**	1.23			0.26		**1.49**
Other multilateral climate change funds	0.87					**0.87**	0.61			0.00		**0.61**
Multilateral financial institutions, including regional development banks	32.87					**32.87**	22.88					**22.88**
Specialised United Nations bodies	15.50					**15.50**	10.79					**10.79**
Other multilateral	16.21			0.40		**16.61**	11.28			0.28		**11.56**
Total contributions through bilateral, regional and other channels[39]		**27.23**	**16.90**	**5.65**		**49.78**	**0.00**	**18.96**	**11.76**	**3.93**	**0.00**	**34.65**
TOTAL	**67.21**	**27.23**	**16.90**	**6.43**	**0.00**	**117.77**	**46.79**	**18.96**	**11.76**	**4.48**	**0.00**	**81.98**

[39] Figures have been rounded and this may result in a total disagreeing with the total of the individual items as shown in the tables. The impact of this rounding is minor, for example, the rounded total of bilateral adaptation contributions shows in CTF table 7 as 25.37 while the total of the relevant individual items in CTF table 7b amounts to 25.34.

CTF Table 7a: Provision of public financial support: contributions through multilateral channels in 2015

Donor funding	Total amount Core/general NZD million	Total amount Core/general USD million	Climate specific NZD million	Climate specific USD million	Status	Funding source	Financial instrument	Type of support	Sector
Multilateral climate change funds									
1. Global Environment Facility	1.81	1.26			Disbursed	ODA	Capital subscription	Cross cutting	General environment
2. Green Climate Fund		0.00	3.00	2.09	Disbursed	ODA	Grant	Cross cutting	General environment
3. United Nations Framework Convention on Climate Change Trust Fund for Supplementary Activities		0.00	0.13	0.09	Disbursed	ODA	Grant	Cross cutting	General environment
4. Montreal Protocol	0.61	0.42			Disbursed	ODA	Grant	Cross cutting	General environment
Subtotal	**2.42**	**1.69**	**3.13**	**2.18**					
Multilateral financial institutions, including regional development banks									
1. World Bank	17.29	12.06			Disbursed	ODA	Capital subscription	Cross cutting	Cross cutting
2. Asian Development Bank	10.38	7.24			Disbursed	ODA	Capital subscription	Cross cutting	Cross cutting
Subtotal	**27.67**	**19.30**	**0.00**	**0.00**					
Specialised United Nations bodies									
1. United Nations Development Programme	8.00	5.58			Disbursed	ODA	Grant	Cross cutting	Cross cutting
2. International Fund for Agricultural Development	1.50	1.05			Disbursed	ODA	Grant	Adaptation	Agriculture
3. World Food Programme	6.00	4.18			Disbursed	ODA	Grant	Cross cutting	Cross cutting
Subtotal	**15.50**	**10.81**	**0.00**	**0.00**					
Other multilateral									
1. CGIAR Fund	3.50	2.44			Disbursed	ODA	Grant	Cross cutting	Agriculture
2. International Renewable Energy Agency	0.08	0.05	0.50	0.35	Disbursed	ODA	Grant	Mitigation	Energy

Donor funding	Total amount Core/general NZD million	Total amount Core/general USD million	Climate specific NZD million	Climate specific USD million	Status	Funding source	Financial instrument	Type of support	Sector
3. Pacific Islands Forum Secretariat	3.11	2.17			Disbursed	ODA	Grant	Cross cutting	Cross cutting
4. Pacific Regional Environment Programme	1.53	1.07			Disbursed	ODA	Grant	Cross cutting	General environment
5. Secretariat of the Pacific Community	6.13	4.27			Disbursed	ODA	Grant	Cross cutting	Cross cutting
Subtotal	**14.35**	**10.00**	**0.50**	**0.35**					
TOTAL	**59.94**	**41.79**	**3.63**	**2.53**					

Note: ODA = official development assistance.

CTF Table 7a: Provision of public financial support: contributions through multilateral channels in 2016

Donor funding	Total amount Core/general NZD million	Total amount Core/general USD million	Climate specific NZD million	Climate specific USD million	Status	Funding source	Financial instrument	Type of support	Sector
Multilateral climate change funds									
1. Global Environment Facility (GEF)	1.76	1.23			Disbursed	ODA	Capital subscription	Cross cutting	General environment
2. GEF Capacity Building Initiative for Transparency (CBIT)			0.13	0.09	Disbursed	ODA	Grant	Cross cutting	General environment
3. United Nations Framework Convention on Climate Change (UNFCCC) Trust Fund for Participation			0.02	0.01	Disbursed	ODA	Grant	Cross cutting	General environment
4. UNFCCC Trust Fund for Supplementary Activities			0.23	0.16	Disbursed	ODA	Grant	Cross cutting	General environment
5. Montreal Protocol	0.87	0.61			Disbursed	ODA	Grant	Cross cutting	General environment
Subtotal	**2.64**	**1.84**	**0.38**	**0.26**					
Multilateral financial institutions, including regional development banks									
1. World Bank	17.29	12.04			Disbursed	ODA	Capital subscription	Cross cutting	Cross cutting
2. Asian Development Bank	15.58	10.84			Disbursed	ODA	Capital subscription	Cross cutting	Cross cutting
Subtotal	**32.87**	**22.88**	**0.00**	**0.00**					
Specialised United Nations bodies									
1. United Nations Development Programme	8.00	5.57			Disbursed	ODA	Grant	Cross cutting	Cross cutting
2. International Fund for Agricultural Development	1.50	1.04			Disbursed	ODA	Grant	Adaptation	Agriculture
3. World Food Programme	6.00	4.18			Disbursed	ODA	Grant	Cross cutting	Cross cutting
Subtotal	**15.50**	**10.79**	**0.00**	**0.00**					

Donor funding	Total amount Core/general NZD million	Total amount Core/general USD million	Total amount Climate specific NZD million	Total amount Climate specific USD million	Status	Funding source	Financial instrument	Type of support	Sector
Other multilateral									
1. CGIAR Fund	5.50	3.83			Disbursed	ODA	Grant	Cross cutting	Agriculture
2. FONTAGRO		0.00	0.40	0.33	Disbursed	ODA	Grant	Cross cutting	Agriculture
3. International Renewable Energy Agency	0.09	0.06			Disbursed	ODA	Grant	Mitigation	Energy
4. Pacific Islands Forum Secretariat	3.11	2.16			Disbursed	ODA	Grant	Cross cutting	Cross cutting
5. Pacific Regional Environment Programme	1.53	1.07			Disbursed	ODA	Grant	Cross cutting	General environment
6. Secretariat of the Pacific Community	5.98	4.16			Disbursed	ODA	Grant	Cross cutting	Cross cutting
Subtotal	**16.21**	**11.28**	**0.40**	**0.28**					
TOTAL	**67.21**	**46.79**	**0.78**	**0.54**					

Note: ODA = official development assistance.

CTF Table 7b: Provision of public financial support: contributions through bilateral, regional and other channels in 2015

Recipient country/programme/activity[40]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Cook Islands / Renewable Energy (Airport West & Enabling)	0.21	0.15	Disbursed	ODA	Grant	Mitigation	Energy
Cook Islands / Renewable Energy (Northern Group)	7.49	5.22	Disbursed	ODA	Grant	Mitigation	Energy
Cook Islands / Tropic Twilight 2015	0.91	0.63	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Cook Islands / Wastewater Activity	0.79	0.55	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Cook Islands / Water Partnership (Te Mato Vai)	0.90	0.63	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Federated States of Micronesia / North Pacific Development Fund	0.14	0.10	Disbursed	ODA	Grant	Mitigation	General environment
Fiji / Evacuation Centres Upgrade Project	0.30	0.21	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Fiji / Rotahomes Koroipita Project (Phase 2)	0.28	0.20	Disbursed	ODA	Grant	Adaptation	Other social infrastructure and services
Kiribati / Kiritimati Island Energy Sector Programme	0.44	0.30	Disbursed	ODA	Grant	Mitigation	Energy
Kiribati / Water and Sanitation, including rainwater harvesting	0.53	0.37	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Niue / Energy Support	0.25	0.17	Disbursed	ODA	Grant	Mitigation	Energy
Papua New Guinea / Enga Hydro	0.35	0.24	Disbursed	ODA	Grant	Mitigation	Energy
Papua New Guinea / Increasing Access to Electricity for Rural Communities	2.10	1.46	Disbursed	ODA	Grant	Mitigation	Energy
Papua New Guinea / Oxfam El Niño Response in Simbu Province	0.29	0.20	Disbursed	ODA	Grant	Cross cutting	Disaster prevention and preparedness
Papua New Guinea / Rural On Grid Extension Project	0.30	0.21	Disbursed	ODA	Grant	Mitigation	Energy
Papua New Guinea / SFML Drought Mitigation and Adaptation in Simbu	0.11	0.07	Disbursed	ODA	Grant	Cross cutting	Disaster prevention and preparedness

[40] Bilateral activities with a moderated value of less than NZ$100,000 have been grouped together and are listed in the 'Other activities'.

Recipient country/programme/activity[40]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Samoa / Renewable Energy Partnership (SED)	2.09	1.46	Disbursed	ODA	Grant	Mitigation	Energy
Samoa / Tourism Infrastructure – Apia Waterfront Development	0.15	0.10	Disbursed	ODA	Grant	Adaptation	Tourism
Solomon Islands / Domestic Maritime Support Project	0.12	0.09	Disbursed	ODA	Grant	Adaptation	Transport
Solomon Islands / Fisheries Development	1.91	1.33	Disbursed	ODA	Grant	Adaptation	Fishing
Solomon Islands / Photovoltaic Power Generation	2.77	1.93	Disbursed	ODA	Grant	Mitigation	Energy
Tonga / Energy: Village Network Upgrade Project S2&3	1.78	1.24	Disbursed	ODA	Grant	Mitigation	Energy
Tonga / Energy: Wind and Biomass Feasibility	0.11	0.07	Disbursed	ODA	Grant	Mitigation	Energy
Tonga / Renewable Energy Solar Project	0.33	0.23	Disbursed	ODA	Grant	Mitigation	Energy
Tuvalu / Borrow Pits Remediation	9.28	6.47	Disbursed	ODA	Grant	Adaptation	General environment
Tuvalu / Renewable Energy Projects	7.24	5.05	Disbursed	ODA	Grant	Mitigation	Energy
Vanuatu / Inter-Island Shipping Programme	0.33	0.23	Disbursed	ODA	Grant	Adaptation	Transport
Vanuatu / Support to Wan Smolbag 2015–2019	0.15	0.11	Disbursed	ODA	Grant	Adaptation	Government and civil society, general
Vanuatu / Vanuatu Tourism Infrastructure Project (VTIP)	1.46	1.01	Disbursed	ODA	Grant	Adaptation	Tourism
Vanuatu / Water Supply Systems and Sector Strengthening	0.74	0.52	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Pacific Regional / Fisheries: Tuna Science and Information	0.17	0.12	Disbursed	ODA	Grant	Adaptation	Fishing
Pacific Regional / Fisheries: Tuna Investment and Export Facilitation	0.25	0.17	Disbursed	ODA	Grant	Adaptation	Fishing
Pacific Regional / Ocean Acidification	0.75	0.53	Disbursed	ODA	Grant	Adaptation	General environment
Pacific Regional / Pacific Region Infrastructure Facility (PRIF)	0.30	0.21	Disbursed	ODA	Grant	Cross cutting	Transport
Pacific Regional / Strengthening Water Security in Vulnerable Island States	0.24	0.16	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Pacific Regional / Sustainable Development and Energy Advisor	0.13	0.09	Disbursed	ODA	Grant	Cross cutting	Energy

Recipient country/programme/activity[40]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Pacific Regional / University of the South Pacific	1.50	1.05	Disbursed	ODA	Grant	Cross cutting	Education
Afghanistan / Renewable Energy Capability Building and Technical Support	0.44	0.31	Disbursed	ODA	Grant	Mitigation	Energy
Afghanistan / Renewable Energy Programme	0.56	0.39	Disbursed	ODA	Grant	Mitigation	Energy
Cambodia / Development of Commercial Horticulture	0.57	0.40	Disbursed	ODA	Grant	Cross cutting	Agriculture
Cambodia / Disaster Resilience through Improved Education	0.15	0.11	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Indonesia / CaRED: Research and Development Support Programme	0.28	0.19	Disbursed	ODA	Grant	Adaptation	Industry
Indonesia / DRM: GNS – Reducing Risk from Disasters	1.07	0.75	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Indonesia / Energy: Monitoring, Evaluation and Technical Advice	0.33	0.23	Disbursed	ODA	Grant	Mitigation	Energy
Indonesia / Geothermal Energy HRD	0.26	0.18	Disbursed	ODA	Grant	Mitigation	Energy
Laos / Community Resilience through Education	0.70	0.49	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Myanmar / Rakhine Winter Cropping Activity	0.57	0.40	Disbursed	ODA	Grant	Cross cutting	Agriculture
Philippines / BRAVE – Resilience and Food Security	0.18	0.13	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Philippines / Restoring Agricultural-based Income in Cotabato	0.45	0.31	Disbursed	ODA	Grant	Cross cutting	Agriculture
Philippines / Strengthening Red Cross	0.21	0.15	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Viet Nam / Ben Tre DRM/CC	1.14	0.80	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Viet Nam / New Premium Fruit Variety Development	0.10	0.07	Disbursed	ODA	Grant	Adaptation	Agriculture
Asia Regional / ASEAN AHA Centre Training Canterbury University	0.13	0.09	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Asia Regional / Strengthening Disaster Risk Reduction: ADPC	0.25	0.18	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Comoros / Support for Realisation of Geothermal Potential	0.23	0.16	Disbursed	ODA	Grant	Mitigation	Energy

Recipient country/programme/activity[40]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Kenya / Building Resilience for Two Drought Affected Kenyan Communities	0.22	0.16	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Colombia / Colombia Dairy Value Chain Project	0.39	0.27	Disbursed	ODA	Grant	Adaptation	Agriculture
Peru / Dairy Initiative	0.10	0.07	Disbursed	ODA	Grant	Mitigation	Agriculture
Uruguay / Family Farm Improvement Project	0.30	0.21	Disbursed	ODA	Grant	Adaptation	Agriculture
West Indies Regional / Caribbean Geothermal Energy Support	0.60	0.42	Disbursed	ODA	Grant	Mitigation	Energy
Other Activities – Mitigation	0.23	0.16	Disbursed	ODA	Grant	Mitigation	Cross cutting
Other Activities – Adaptation	0.96	0.67	Disbursed	ODA	Grant	Adaptation	Cross cutting
Other Activities – Cross cutting	0.13	0.09	Disbursed	ODA	Grant	Cross cutting	Cross cutting
TOTAL	**57.74**	**40.26**					

Note: ODA = official development assistance.

CTF Table 7b: Provision of public financial support: contributions through bilateral, regional and other channels in 2016

Recipient country/programme/activity[41]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Cook Islands / Renewable Energy (Northern Group)	0.10	0.07	Disbursed	ODA	Grant	Mitigation	Energy
Cook Islands / Water Partnership (Te Mato Vai)	0.91	0.63	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Fiji / Child Focused DRR	0.44	0.30	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Fiji / DRM Community Solar Lanterns Project	0.50	0.35	Disbursed	ODA	Grant	Cross cutting	Energy
Fiji / Evacuation Centres Upgrade Project	0.16	0.11	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Kiribati / Kiritimati Island Energy Sector Programme	0.45	0.31	Disbursed	ODA	Grant	Mitigation	Energy
Kiribati / Water and Sanitation, including rainwater harvesting	0.33	0.23	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Kiribati / Water and Sanitation 2015–2020	0.10	0.07	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Papua New Guinea / Drought Adaptation Strategies in PNG Highlands	0.34	0.24	Disbursed	ODA	Grant	Cross cutting	Disaster prevention and preparedness
Papua New Guinea / Enga Hydro	5.02	3.50	Disbursed	ODA	Grant	Mitigation	Energy
Papua New Guinea / Harvest – Improved Livelihoods and Wellbeing for Women and their Families	0.32	0.22	Disbursed	ODA	Grant	Adaptation	Agriculture
Papua New Guinea / Increasing Access to Renewable Energy	0.49	0.34	Disbursed	ODA	Grant	Cross cutting	Energy
Papua New Guinea / NGO Drought Funding Round	0.73	0.50	Disbursed	ODA	Grant	Cross cutting	Disaster prevention and preparedness
Papua New Guinea / Rural On Grid Extension Project	2.99	2.08	Disbursed	ODA	Grant	Mitigation	Energy
Papua New Guinea / SFML Drought Mitigation and Adaptation in Simbu	0.15	0.10	Disbursed	ODA	Grant	Cross cutting	Disaster prevention and preparedness

[41] Bilateral activities with a moderated value of less than NZ$100,000 have been grouped together and are listed in the 'Other activities'.

Recipient country/programme/activity[41]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Papua New Guinea / Support for Food Distribution for Drought	0.75	0.52	Disbursed	ODA	Grant	Mitigation	Disaster prevention and preparedness
Samoa / Renewable Energy Partnership (SED)	2.51	1.75	Disbursed	ODA	Grant	Mitigation	Energy
Solomon Islands / Fisheries Development	2.14	1.49	Disbursed	ODA	Grant	Adaptation	Fishing
Solomon Islands / Photovoltaic Power Generation	0.28	0.19	Disbursed	ODA	Grant	Mitigation	Energy
Tonga / Energy: Village Network Upgrade Project S2&3	8.33	5.80	Disbursed	ODA	Grant	Mitigation	Energy
Tonga / Energy: Wind and Biomass Feasibility	0.11	0.08	Disbursed	ODA	Grant	Mitigation	Energy
Tonga / Renewable Energy Solar Project	0.33	0.23	Disbursed	ODA	Grant	Mitigation	Energy
Tuvalu / Borrow Pits Remediation	0.12	0.08	Disbursed	ODA	Grant	Adaptation	General environment
Tuvalu / Renewable Energy Projects	1.98	1.38	Disbursed	ODA	Grant	Mitigation	Energy
Vanuatu / Agricultural Development for Tanna's Economic Growth	0.17	0.12	Disbursed	ODA	Grant	Adaptation	Agriculture
Vanuatu / Central Vanuatu Community Economic Development	0.17	0.12	Disbursed	ODA	Grant	Adaptation	Business and other services
Vanuatu / Cyclone Pam Recovery	0.96	0.67	Disbursed	ODA	Grant	Adaptation	Reconstruction relief and rehabilitation
Vanuatu / Inter-island Shipping Programme	0.52	0.36	Disbursed	ODA	Grant	Adaptation	Transport
Vanuatu / Rural Electrification Project	0.48	0.33	Disbursed	ODA	Grant	Mitigation	Energy
Vanuatu / Support to Wan Smolbag 2015–2019	0.12	0.08	Disbursed	ODA	Grant	Adaptation	Government and civil society, general
Vanuatu / Tourism Assistance Programme	0.13	0.09	Disbursed	ODA	Grant	Adaptation	Tourism
Vanuatu / Vanuatu Tourism Infrastructure Project (VTIP)	3.56	2.48	Disbursed	ODA	Grant	Adaptation	Tourism
Vanuatu / Water Supply Systems and Sector Strengthening	0.24	0.17	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Pacific Regional / Climate Change and DRR Research	0.16	0.11	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness

Recipient country/programme/activity[41]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Pacific Regional / Effective Coastal Fisheries Management	0.47	0.32	Disbursed	ODA	Grant	Adaptation	Fishing
Pacific Regional / GCF Technical Assistance Programme (TAPA)	0.07	0.05	Disbursed	ODA	Grant	Cross-cutting	General environment
Pacific Regional / Ocean Acidification	0.31	0.22	Disbursed	ODA	Grant	Adaptation	General environment
Pacific Regional / Office of UNGA President Samoa Secondee	0.12	0.08	Disbursed	ODA	Grant	Cross cutting	Multisector
Pacific Regional / Pacific Energy Conference 2016	0.74	0.51	Disbursed	ODA	Grant	Mitigation	Energy
Pacific Regional / Pacific Region Infrastructure Facility (PRIF)	0.30	0.21	Disbursed	ODA	Grant	Cross cutting	Transport
Pacific Regional / PFTAC Phase 5	1.50	1.04	Disbursed	ODA	Grant	Mitigation	Government and civil society, general
Pacific Regional / Strengthening Water Security in Vulnerable Island States	0.42	0.29	Disbursed	ODA	Grant	Adaptation	Water supply and sanitation
Pacific Regional / Sustainable Aquaculture Development	0.25	0.17	Disbursed	ODA	Grant	Adaptation	Fishing
Pacific Regional / University of the South Pacific	1.50	1.04	Disbursed	ODA	Grant	Cross cutting	Education
Afghanistan / Renewable Energy Capability Building and Technical Support	0.42	0.29	Disbursed	ODA	Grant	Mitigation	Energy
Asia Regional / ASEAN AHA Centre Training Canterbury University	0.15	0.10	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Cambodia / Development of Commercial Horticulture	0.40	0.28	Disbursed	ODA	Grant	Cross cutting	Agriculture
Cambodia / Disaster Resilience through Improved Education	0.14	0.10	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Colombia / Colombia Dairy Value Chain Project	0.30	0.21	Disbursed	ODA	Grant	Adaptation	Agriculture
Indonesia / CaRED: Research and Development Support Programme	0.29	0.20	Disbursed	ODA	Grant	Adaptation	Industry
Indonesia / DRM: GNS – Reducing Risk from Disasters	1.22	0.85	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness

Recipient country/programme/activity[41]	Total amount Climate specific NZD million	USD million	Status	Funding source	Financial instrument	Type of support	Sector
Indonesia / DRM: National Disaster Management Framework	0.19	0.13	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Indonesia / Energy: Monitoring, Evaluation and Technical Advice	0.17	0.12	Disbursed	ODA	Grant	Mitigation	Energy
Indonesia / Massey Agribusiness Innovation in Eastern Indonesia	0.23	0.16	Disbursed	ODA	Grant	Adaptation	Agriculture
Myanmar / Rakhine Winter Cropping Activity	0.60	0.42	Disbursed	ODA	Grant	Cross-cutting	Agriculture
Viet Nam / Ben Tre DRM/CC	0.61	0.42	Disbursed	ODA	Grant	Adaptation	Disaster prevention and preparedness
Viet Nam / Building Strong and Resilient Communities	0.24	0.16	Disbursed	ODA	Grant	Adaptation	Agriculture
Viet Nam / GNS Dam Safety Project	0.41	0.28	Disbursed	ODA	Grant	Adaptation	General environment
Viet Nam / New Premium Fruit Variety Development	0.11	0.07	Disbursed	ODA	Grant	Adaptation	Agriculture
Peru / Dairy Initiative	0.19	0.13	Disbursed	ODA	Grant	Mitigation	Agriculture
Uruguay / Family Farm Improvement Project	0.26	0.18	Disbursed	ODA	Grant	Adaptation	Agriculture
West Indies Regional / Caribbean Geothermal Energy Support	0.32	0.23	Disbursed	ODA	Grant	Mitigation	Energy
Other activities – Mitigation	0.56	0.39	Disbursed	ODA	Grant	Mitigation	Cross cutting
Other activities – Adaptation	0.77	0.54	Disbursed	ODA	Grant	Adaptation	Cross cutting
Other activities – Cross cutting	0.46	0.32	Disbursed	ODA	Grant	Cross cutting	Cross cutting
TOTAL	**49.78**	**34.65**					

Note: ODA = official development assistance.

Technology transfer

The development and transfer of climate technologies is critical for achieving the goals of the Paris Agreement to reduce greenhouse gas emissions and adapt to the impacts of climate change. New Zealand is committed to promoting, facilitating and financing the transfer of, access to and deployment of climate-friendly technologies for the benefit of developing countries. Technology transfer is a win–win, helping both developed and developing countries reduce the cost of tackling climate change, while also stimulating opportunities for sustainable development. Practical assistance and cooperative action to accelerate technology development and transfer to help developing country Parties is therefore a priority for New Zealand. During the Seventh National Communication reporting period, New Zealand delivered on these commitments through the New Zealand Aid Programme and the Global Research Alliance on Agricultural Greenhouse Gases. This section reports on these commitments in text and tabular format while referencing other relevant sections of this chapter.

Technology transfer delivered through the New Zealand Aid Programme

As detailed in the section 'Bilateral support' above, country partnerships are at the heart of New Zealand's climate-related support, with countries' identified priorities central to the development support New Zealand provides. The New Zealand Aid Programme is committed to supporting climate change action in developing countries, with particular areas of focus being the Pacific, renewable energy and agriculture. These focus areas are reflected in the sectors most prevalent in CTF table 8 below. In addition, New Zealand has supported a number of technology transfer activities in South-East Asia, Africa and South America, both through the aid programme and the Global Research Alliance on Agricultural Greenhouse Gases, as outlined in CTF table 8.

As detailed above, under 'Mitigation', a priority for the New Zealand Aid Programme has been supporting renewable energy initiatives to enable access to affordable, reliable and clean energy sources reducing carbon emissions, improving energy efficiency and creating low-carbon development pathways. The 'Bilateral support' section above details several examples of renewable energy projects that promoted, facilitated and financed technology transfer for the benefit of non-Annex 1 Parties, and the majority of mitigation activities detailed in CTF table 8 are renewable energy activities.

Another priority in the aid programme has been supporting adaptation projects that reduce the vulnerability of human and natural systems to the impacts of climate change by increasing community and infrastructure resilience. Many of the activities identified in CTF table 8 aim to help communities better meet the challenges of more intense extreme weather events, the increasing risk of drought, sea level rise and changes in fisheries resources. The 'Adaptation' section above details a number of these projects including those focused on water and sanitation, agriculture and disaster resilient infrastructure.

Global Research Alliance on Agricultural Greenhouse Gases

In addition to technology transfer delivered through the New Zealand Aid Programme, under the framework of the Global Research Alliance on Agricultural Greenhouse Gases, New Zealand also promotes and facilitates the development of endogenous and non-endogenous capacities and technologies of developing country Parties in agriculture. New Zealand support enables developing countries to implement their commitments, including in particular by: developing national agricultural inventories; developing, applying and diffusing – including transferring – technologies, practices and processes that control, reduce or prevent

greenhouse gases in the agriculture sector; and conserving and enhancing sinks and reservoirs of all greenhouse gases in terrestrial ecosystems. These outcomes are achieved through a range of research, education, training and public awareness activities focused mainly on mitigation but with some adaptation components. Activities include:

- assisting countries to develop and/or improve their agriculture greenhouse gas inventories consistent with their national circumstances, priorities and capacities (see CTF table 8).
- providing training to South-East Asian countries to improve agricultural development strategies that aim for low greenhouse gas emissions and reduce vulnerability or increase resilience to climate change (see CTF table 8).

Explanation of information provided in CTF table 8

During the reporting period, New Zealand's support for technology transfer included 'hard' technology – tangible components – and 'soft' technology, which includes information and knowledge sharing, training and research. Much of New Zealand's support is a combination of both hard and soft technology, to help ensure that the management and development of climate-friendly technologies are country relevant, sustainable and long lasting. CTF table 8 includes examples of both hard and soft technology transfer, with the majority of activities identified comprising a combination of both.

Similarly, most of the activities identified in CTF table 8 are a combination of endogenous and non-endogenous technology transfer. This helps to ensure that technology transfer is implemented in country-specific ways, building on existing knowledge and practices, and using local governance structures. In recognition of this dual approach, CTF table 8 do not differentiate between endogenous and non-endogenous technology transfer unless specified.

As detailed above in the section 'Bilateral support', New Zealand follows a number of development principles when providing climate-related support through the New Zealand Aid Programme including ownership, alignment, donor harmonisation, results focus and transparency. Because these principles are applied in the delivery of all development support, 'factors that led to the project success' in CTF table 8 identify these criteria. The Global Research Alliance on Agricultural Greenhouse Gases applies a different funding criterion. Where possible, therefore, CTF table 8 (Technology transfer delivered through the Global Research Alliance on Agricultural Greenhouse Gases) identifies factors that led to a project's success in a different way from CTF table 8 (Technology transfer delivered through the New Zealand Aid Programme). These factors are not always recorded and so activities in CTF table 8 (Technology transfer delivered through the Global Research Alliance on Agricultural Greenhouse Gases) do not always include factors that led to a project's success.

As detailed above in 'Bilateral support', New Zealand recognises the importance of private sector investment in contributing to effective climate outcomes in developing countries. The Aid Programme's investment priority of renewable energy offers strong opportunities to increase private sector investment and trade in the Asia–Pacific region. CTF table 8 identifies, where possible, activities where private sector investment was encouraged. Work is currently under way to identify how to incentivise greater private sector investment in the renewable energy sector for the benefit of developing countries. Aside from New Zealand's investments in renewable energy, activities that encourage private sector support are limited.

CTF Table 8: Technology transfer delivered through the New Zealand Aid Programme

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Afghanistan Renewable Energy Programme	To increase use of renewable energy in Bamyan Province	Afghanistan	Energy	Mitigation	Installing 1.05 MWp of photovoltaic arrays, transmission and distribution lines and built local capacity to manage the installations	2013–2015	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	1.05 MWp of photovoltaic arrays	Public	Refer to CTF table 7b
Tonga Energy: Village Network Upgrade	To reduce high network losses, improve community access to the electricity network and prepare it for further renewable energy generation	Tonga	Energy	Mitigation	Replacing and extending the existing electricity network to more villages on Tongatapu	2013	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Networks were rebuilt and extended using New Zealand standards to increase the efficiency of the network	Local lines people were trained to install network assets to New Zealand standards by NorthPower Ltd	Refer to CTF table 7b
Tonga Energy: Village Network Upgrade Project S2&3	To reduce high network losses, improve community access to the electricity network and prepare it for further renewable energy generation	Tonga	Energy	Mitigation	Replacing and extending the existing electricity network to more villages on Tongatapu	2013–2018	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Networks were rebuilt and extended using New Zealand standards to increase the efficiency of the network.	Local lines people were trained to install network assets to New Zealand standards by NorthPower Ltd	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Tonga Renewable Energy Solar Project	To reduce reliance on diesel fuel and increase use of renewable energy	Tonga	Energy	Mitigation	Building a 1.3 MWp solar photovoltaic power plant in Nuku'alofa, which is reducing reliance on diesel fuel supply, reducing greenhouse gas emissions	2013–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	1.3 MWp solar photovoltaic power plant	Partnered with Meridian Energy	Refer to CTF table 7b
Cook Islands Renewable Energy (Airport West & Enabling)	To reducing diesel consumption, build energy resilience and provide over 5 per cent of the Rarotonga's annual energy needs	Cook Islands	Energy	Mitigation	Installing photovoltaic panels	2013–2016		961 kilowatt peak (kWp) of photovoltaic panels connected to the main Rarotongan electricity network	Public	Refer to CTF table 7b
Northern Group Renewable Energy	To switch from reliance on diesel fuel to 90 per cent renewable energy	Cook Islands	Energy	Mitigation	Installed eight solar-diesel-battery hybrid mini-grids on six islands of the Cook Islands' Northern Group	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Eight solar-diesel-battery hybrid mini-grids including 850 kWp of photovoltaic modules	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Rotahomes Koroipita Project (Phase 2)	To improve the infrastructure and resilience of marginalised communities	Fiji	Other	Adaptation	Constructing of cyclone-proof housing, and urban infrastructure, and installing solar street lights	2013–2015	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Houses and buildings have been constructed in line with Fiji building codes to withstand cyclones and other natural hazards compounded by climate change. The Koroipita township serves as a model for low-cost, resilient infrastructure development for marginalised families	Public	Refer to CTF table 7b
Building Resilience for Two Drought Affected Kenyan Communities	To improve drought resilience for two drought affected communities in Kenya	Kenya	Water supply and sanitation	Adaptation	Improving access to water through the provision of boreholes, water pans and drip irrigation systems	2013–2015	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Improved water infrastructure and better management systems for changing weather patterns	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Water Partnership (Te Mato Vai)	To deliver a reliable source of potable water to the population of Rarotonga	Cook Islands	Water supply and sanitation	Adaptation	Ongoing activity that is upgrading Rarotonga's water reticulation system to increase storage capacity, building resilience to more frequent dry spells with climate change	2013–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Water storage tanks, filtration system, pipes	Public	Refer to CTF table 7b
Tanna WaSH Project	To increase resilience to drought	Vanuatu	Water supply and sanitation	Mitigation	Providing water catchments and gravity fed water systems, including the installation of improved spring boxes in the water catchments that are reducing water contamination during floods and cyclones	2013–2014	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Construction of household latrines and water supply of solar powered piped water systems in two communities. Transfer of knowledge to ensure sustainability of water and sanitation systems	Public	Refer to CTF table 7b
Kiribati Water and Sanitation, Including Rainwater Harvesting	To increase Kiribati's resilience to drought events as a result of climate change	Kiribati	Water supply and sanitation	Adaptation	Providing rainwater harvesting systems in South Tarawa's community buildings and refurbishing water and sanitation systems in its two hospitals, as well as improved water	2013–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Rainwater harvesting systems, sanitation systems. Information and knowledge sharing on better water management	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
					resource management and water testing					
Papua New Guinea Sustainable Agriculture and Community Resilience	To increase use of drought resistant farming methods and alternative climate resistant crops	Papua New Guinea	Agriculture	Adaptation	Working with farmers to increase their understanding and use of farming methods and alternative climate resistance crop varieties	2013	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Training and information sharing about climate resilient crops and farming methods	Public	Refer to CTF table 7b
Samoa Indigenous Housing as a Solution to Climate Change	To build prototype traditional buildings that can withstand increasing intensity cyclones	Samoa	Other social infrastructure and services	Adaptation	Building a prototype building using indigenous and current building materials and techniques that can withstand increasingly strong cyclones	2013	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Endogenous technology transfer supporting the development of indigenous building practices and materials to better withstand cyclones	Public	Refer to CTF table 7b
Tuvalu Renewable Energy Projects	Increasing use of renewable energy, reducing greenhouse gas emissions and reliance on diesel fuel	Tuvalu	Energy	Mitigation	Installing hybrid mini-grid systems on the Northern Outer Islands of Nanumaga (195 kW), Nanumea (195 kW) Niutao (232 kW), and Vaitupu (410 kW). New Zealand also funded the installation of grid-	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation – project coordination with the European Union (EU) and United Arab Emirates, results focused, transparency	Two 195 kW, one 232 kW and one 410 kW hybrid mini-grid photovoltaic systems. Grid-connected rooftop photovoltaic systems. Training on the operation and	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
					connected rooftop photovoltaic arrays on media and government public buildings in Funafuti			maintenance of the systems		
Samoa Renewable Energy Partnership	To increase use of renewable energy in Samoa	Samoa	Energy	Mitigation	Installing three photovoltaic arrays and co-financing with the Asian Development Bank (ADB) three rehabilitated and three new hydro-power plants. Support to asset management and capacity building	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation – partners with the EU and the ADB, results focused, transparency	2.58 MWp photovoltaic arrays and contributing to ADB-led rehabilitation and new hydro-power plants	Public	Refer to CTF table 7b
Vanuatu Rural Electrification Project	To support the distribution of solar home systems to off-grid households in rural areas to replace the use of petroleum for light and power	Vanuatu	Energy	Mitigation	New Zealand contributed to the World Bank to support the distribution of solar home systems to off-grid households in rural areas to replace the use of petroleum for light and power	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Solar home systems	Yes, model includes local private sector as vendor to distribute solar home systems in Vanuatu (World Bank led)	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Tuvalu Borrow Pits Remediation	To fill in pits on Tuvalu's most populated island Funafuti where soil was 'borrowed' for the airport runway, providing 6 per cent more useable land and increasing resilience to sea level rise and significant weather events	Tuvalu	General environment	Adaptation	Dredging sand from the lagoon and transferring it into the pits. Shoreline strengthening was also undertaken where it had been eroded	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	A complex project that required significant engineering, knowledge sharing and technical support to build resilience to climate change	Public	Refer to CTF table 7b
Vanuatu Water Supply Systems and Sector Strengthening	To increase resilience to drought	Vanuatu	Water and sanitation	Adaptation	Assisting with the recovery of the water, sanitation and hygiene in Vanuatu following Tropical Cyclone Pam	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency Community ownership through Participatory Hygiene and Sanitation Training	Technical and strategic advice to assist with the design, management and maintenance of climate-resilient water projects	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Vanuatu Water and Sanitation on Tanna and Pentecost	To increase resilience to drought	Vanuatu	Water and sanitation	Mitigation	Providing water catchments and gravity fed water systems, including the installation of improved spring boxes in the water catchments that are reducing water contamination during floods and cyclones	2014	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Water reticulation systems	Public	Refer to CTF table 7b
Papua New Guinea Enga Hydro	To extend electricity access to over 15,200 people	Papua New Guinea	Energy	Mitigation	Installing a 500 kW – 1 MW mini hydro plant on the Tare River	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	500 kW–1 MW mini hydro plant and local electricity distribution network	Public	Refer to CTF table 7b
Caribbean Geothermal Energy Support	To expand access to geothermal energy	West Indies regional	Energy	Mitigation	Providing technical assistance and project management support implemented by an in-country geothermal advisor to develop the geothermal resource. Technical assistance package laid the ground for larger donors and the private sector to	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Enabling technology transfer though information and knowledge sharing and training to encourage public and private sector investment in the geothermal sector	Encouraging private sector investment	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
					invest further in geothermal energy generation					
Solomon Islands Photovoltaic Power Generation	To increase Solomon Islands uptake of renewable energy	Solomon Islands	Energy	Mitigation	Jointly funded project, a partnership with the United Arab Emirates to install 1 MW of grid-connected solar photovoltaic arrays to provide approximately 4 per cent of Honiara's electricity needs and save more than 450,000 litres of diesel	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	1 MWp grid-connected photovoltaic plant	Public	Refer to CTF table 7b
Papua New Guinea Rural On Grid Extension Project	To extend the Port Moresby grid and to connect more consumers who were previously without electricity access	Papua New Guinea	Energy	Mitigation	Ongoing activity extending the Port Moresby Grid by 36 kilometres to bring electricity from a hydro plant to approximately 15,000 direct beneficiaries	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Support for PNG Power Ltd to extend grid	Public	Refer to CTF table 7b
Fiji Evacuation Centres Upgrade Project	To provide greater access to safe emergency evacuation	Fiji	Disaster prevention and preparedness	Adaptation	Strengthening disaster evacuation centres to withstand increased disaster events	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation,	Buildings have been constructed in line with Fiji building codes to withstand	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
	centres during disasters						results focused, transparency	cyclones and other natural hazards compounded by climate change		
Pacific Regional Strengthening Water Security in Vulnerable Island States	To strengthen water availability in five low-lying Pacific islands that are subject to drought and water shortages	Tuvalu, Tokelau, Kiribati, Cook Islands and the Republic of Marshall Islands	Water and sanitation	Adaptation	Funding the appointment, training and operation of five water security officers who are placed in government departments to provide technical support, water security planning and implementation	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Funding has enabled the purchase of equipment for groundwater monitoring and effective management of water supply to withstand more intense drought events	Public	Refer to CTF table 7b
Comoros Support for Realisation of Geothermal Potential	Provide technical assistance to support the Comoros Government to develop its geothermal energy resource	Comoros	Energy	Mitigation	Providing technical assistance to support the development of geothermal resource surface exploration, infrastructure assessments and fundraising for exploratory drilling	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Enabling geothermal development through technical assistance	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Papua New Guinea SFML Drought Mitigation and Adaptation in Simbu	To increase resilience to drought	Papua New Guinea	Disaster prevention and preparedness	Adaptation	Replacing and installing more communal water tanks and repair piping to maximise rainwater harvesting	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Water tanks, pipes	Public	Refer to CTF table 7b
Tonga Energy: Wind and Biomass Feasibility	To determine feasibility of wind generation	Tonga	Energy	Mitigation	Partnership with Japan to determine feasibility of a wind and biomass farm	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Promoting technology transfer through technical assistance in assessment and design of a wind farm	Public	Refer to CTF table 7b
Fiji DRM Community Solar Lanterns Project	To improve access to solar lighting for 3000 people and 700 homes across five informal settlements where there is no access to electricity	Fiji	Energy	Cross cutting	Activity that is providing a reliable lighting source for 3000 people, reducing emissions and building community resilience	2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Solar powered lanterns	Public	Refer to CTF table 7b
Papua New Guinea Increasing Access to	To develop a pipeline of projects to increase access in	Papua New Guinea	Energy	Mitigation	Activity identifying and project managing delivery of rural and remote renewable-	2016	Country ownership, alignment with country strategies and priorities, donor harmonisation,	Rural and remote renewable-diesel-battery hybrid mini-grids	Tranche 1 project may be a private sector owner–operator	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Renewable Energy	remote areas				diesel-battery hybrid mini-grids		results focused, transparency			
Kiritimati Island Energy Sector Programme	To upgrade the electricity network on Kiritimati Island and provide some renewable generation	Kiribati	Energy	Mitigation	Installing more fuel efficient generators, improving the distribution network and installing photovoltaic system supplying 15 per cent of the electricity demand	2016	Country ownership, alignment with country strategies and priorities, donor harmonisation – joint project with the EU, results focused, transparency	More fuel efficient generators, photovoltaic system. Significant capability building to ensure local operators maintain the systems appropriately for long life	Public	Refer to CTF table 7b
Kiribati Water and Sanitation 2015–2020	To increase Kiribati's resilience to drought events as a result of climate change	Kiribati	Water supply and sanitation	Adaptation	The second stage of this adaptation activity is providing more community rainwater harvesting systems, improving South Tarawa's reticulated water supply and sewerage systems, and scoping possible investment in desalination	2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Rainwater harvesting systems, sanitation systems. Information and knowledge sharing on better water management	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Solomon Island Domestic Maritime Support	To construct and rehabilitate 13 wharves and three landing strips	Solomon Islands	Infrastructure	Adaptation	Constructing and rehabilitating 13 wharves and three landing strips, all of which have been designed to withstand sea level rise	2014–2015	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Engineering technical expertise to design climate resilient wharves and ramps	Public	Refer to CTF table 7b
Vanuatu Tourism Infrastructure Project	To strengthen areas of the Port Vila Seafront Precinct to withstand storm surges and sea level rise	Vanuatu	Infrastructure	Adaptation	Strengthening areas of the Port Vila Seafront Precinct to withstand storm surges and sea level rise	2015–2016	Country ownership, results focused, transparency	Engineering technical expertise to design climate resilient seafront able to withstand climate projections of cyclones, sea level rise and rainfall	Public	Refer to CTF table 7b
Vanuatu Inter-island Shipping Project	To promote economic development through strengthened transportation modes and agencies and public sector	Vanuatu	Transport	Adaptation	Building wharves and landing ramps to withstand projected sea level rise and storm surges	2013–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Engineering technical expertise to design climate resilient wharves and ramps	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Solar Power in Primary Schools (SDF 2-134)	To increase lighting in Solomon Islands primary schools	Solomon Islands	Energy	Mitigation	Installing solar power systems in 10 rural primary schools and providing training in solar power system operation and basic maintenance	2013–2014	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Photovoltaic systems for 10 schools (average of two per school)	Public	Refer to CTF table 7b
Vanuatu Geothermal Energy Support	To provide technical assistance to support the Government of Vanuatu to develop its geothermal energy resource	Vanuatu	Energy	Mitigation	Technical assistance to support the Government of Vanuatu to develop its geothermal energy resource	2014–2015	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Promoting development of renewable geothermal energy	Public	Refer to CTF table 7b
Fisheries: Tuna Science and Information	To improve management of tuna fisheries resource and adapt to the effects of climate change	Pacific region	Other	Adaptation	Tagging and tracing fisheries resource in the Pacific region to better manage fish stocks in the region	2013–2015	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Improving fisheries management by tagging and tracing of fisheries resource with changing oceanic conditions including those resulting from climate change	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
MMR Rakhine Winter Cropping Activity	To improve food security and generate more sustainable farming systems in Rakhine State, Myanmar	Myanmar	Agriculture	Cross cutting	Activity to improve agriculture farm systems so they are more resilient to changing weather patterns through better water management and crop diversification	2014–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Selecting crops that are resilient to harsh weather conditions; improving soil management; better water harvesting, storage irrigation systems	Public	Refer to CTF table 7b
Pacific Energy Initiatives	To enable private sector energy investment in the Pacific	Pacific region	Energy	Mitigation	Technical assistance to enable Pacific Island countries to encourage and enable independent power producer projects	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Technical assistance and capability building to enable and encourage private sector renewable energy generation projects	Initiative was aimed at supporting private sector investment in the Pacific region	Refer to CTF table 7b
Niue Renewable Energy Design	To increase renewable energy production	Niue	Energy	Mitigation	Increasing renewable energy production and reduce reliance on fossil fuels through solar modules	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	600 kWp solar modules, 800 kW/1 MWh battery, 750 kW power control system, remediation of existing solar and grid, plus capacity building for local utility	Public	Refer to CTF table 7b

Project title	Purpose of the project	Recipient country or countries	Sector	Targeted area	Description of the project	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector – was private sector activity encouraged?	Total funding
Vanuatu Water Supply Systems and Sector Strengthening	To rehabilitate water and sanitation facilities	Vanuatu	Water and sanitation	Adaptation	Partnership with the United Nations Children's Fund (UNICEF) to strengthen information systems and build water and sanitation infrastructure	2015–2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Water and sanitation infrastructure that enables more reliable access to water with changing weather patterns	Public	Refer to CTF table 7b
Cook Island Invasive Species Biocontrols	To improve food security and build climate resilience by suppressing invasive weeds that inhibit crop growth in changing climatic conditions	Cook Islands	Other	Adaptation	Using imported biocontrol agents to sustainably control and supress invasive weeds	2016	Country ownership, alignment with country strategies and priorities, donor harmonisation, results focused, transparency	Using biocontrol agents and weed management techniques to reduce climate change related invasive weed species	Public	Refer to CTF table 7b

Note: ADB = Asian Development Bank; EU = European Union; kW = kilowatt; kWp = kilowatt peak; MWh = megawatt hour; MWp = megawatt peak.

CTF Table 8: Technology transfer delivered through the Global Research Alliance on Agricultural Greenhouse Gases

Project title	Purpose	Recipient country or countries	Sector	Targeted area	Description	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector	Total funding (NZ$)
High Tier Agriculture Inventories in South-East Asia	To assist South-East Asian countries to develop higher tier agricultural inventories in South-East Asia	Thailand, Indonesia, Malaysia, Philippines, Sri Lanka, Viet Nam, Papa New Guinea, Canada, Colombia and Japan	Agriculture	Mitigation	Developing Tier 2 inventories to measure the impacts of mitigation technologies and practices	2016		Identification of barriers and enabling factors for improving emissions inventories; sharing of country experiences and successful examples; and identified links with other regional projects	Public	83,059
Livestock Mitigation in South-East Asia	To develop regional livestock mitigation project in Asia	Indonesia, Malaysia, Philippines, Sri Lanka, Thailand and Viet Nam	Agriculture	Mitigation	A workshop to develop enteric methane projects based on country needs that supported specific development goals and focus areas	2016	Used lessons learned from similar projects implemented in other regions	Created enabling environment for climate-friendly agriculture methods and technologies by developing ways to consolidate and merge productivity, mitigation and inventory activities into a coherent regional network of countries	Public	69,885

Project title	Purpose	Recipient country or countries	Sector	Targeted area	Description	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector	Total funding (NZ$)
Global Research Alliance – Sri Lanka Engagement	A workshop on the Global Research Alliance on Agricultural Greenhouse Gases, and opportunities for engagement with Sri Lanka	Sri Lanka	Agriculture	Mitigation	A workshop to develop enteric methane projects based on country needs that supported specific development goals and focus areas	2016	Included partners from the wider regional enteric methane project (science, policy and industry) together with additional policy-makers from the inventory team and line ministries (agriculture, rural development and environment)	Developing a project to identify practices that improve efficiency and livelihoods while reducing greenhouse gas intensity and capturing these gains through the development of higher tier inventories	Public	26,597
Malaysian Inventory Training	To incorporate livestock emissions into Malaysia's national inventory	Malaysia	Agriculture	Mitigation	A workshop that brought together researchers and policy-makers to include livestock emissions in Malaysia's inventory	2016		Created an enabling environment for the uptake of climate-friendly livestock management systems and technology by incorporating livestock emissions in Malaysia's inventory	Public	43,733
African Inventory Training	To improve agriculture greenhouse gas inventories of Ghana, Botswana and South Africa	Ghana, Botswana and South Africa	Agriculture	Mitigation	Improving and monitoring three African countries' agriculture greenhouse gas inventories	2015		Created an enabling environment for the uptake of climate-friendly agricultural practices and technologies through	Public	62,901

Project title	Purpose	Recipient country or countries	Sector	Targeted area	Description	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector	Total funding (NZ$)
								training to develop agricultural inventories, included overview of using Intergovernmental Panel on Climate Change methods, agriculture land use and Tier 2 inventories		
South-East Asia Inventory and Monitoring Training	To identify the steps needed for participating countries to improve their inventories consistent with their national circumstances, priorities and capacities	Indonesia, Malaysia, Philippines, Sri Lanka, Thailand, Viet Nam	Agriculture	Mitigation and adaptation	This workshop identified the benefits of higher tier greenhouse gas inventories for livestock systems and the steps needed for participating countries to improve their inventories consistent with their national circumstances, priorities and capacities	2015	Built on previously successful Asia–Pacific Economic Cooperation (APEC) project Was consistent with participating countries national circumstances, priorities and capacities	Created enabling environments for climate-friendly livestock management and technologies by building on outcomes from APEC activity 'Climate Change Adaptation Options in Livestock with Mitigation Potential', and the regional South-East Asia Inventory Project	Public	125,974
South-East Asia Farm Systems	To improve agricultural development strategies that aim for low greenhouse gas	Cambodia, China, Indonesia, Japan, Korea, Lao PDR,	Agriculture	Mitigation and adaptation	New Zealand support for a Netherlands-funded workshop with participants from science institutes and policy-makers	2015	High calibre of participants from science institutes and governments	Promoted climate-friendly agricultural development strategies that aim for low greenhouse gas emissions and	Public	34,500

Project title	Purpose	Recipient country or countries	Sector	Targeted area	Description	Year(s)	Factors that led to the project's success	Technology transferred	Activities undertaken by public or private sector	Total funding (NZ$)
	emissions and reduce vulnerability or increase resilience to climate change in participating countries	Malaysia, Myanmar, Philippines, Viet Nam, Thailand, Sri Lanka						increased resilience to climate change		
Livestock and Climate Change	To build regional leadership on livestock and climate change, and methods for measuring greenhouse gas emissions	Ethiopia, Kenya, Uganda, Tanzania, Rwanda, Burundi, Malawi, Zambia, Botswana, Namibia, Zimbabwe, South Africa	Agriculture	Mitigation	Training to undertake nitrous oxide measurements from manual and automatic chambers and methane emission measurements from ruminants using the sulphur hexafluoride tracer technique and respiration chambers	2015		Promoting climate-friendly livestock management through training for nitrous oxide and methane measurements	Public	41,449

Capacity building

To mitigate and adapt to climate change, countries must have the capacity to do so. New Zealand recognises the important role that enhancing the capacity and ability of developing countries to take effective climate change action must play in responding to climate change. New Zealand provides capacity building support that responds to the existing and emerging capacity building needs identified by developing country Parties in the areas of mitigation, adaptation, and technology development and transfer. This occurs through a number of mechanisms including the New Zealand Aid Programme, the Global Research Alliance on Agricultural Greenhouse Gases, the UNFCCC and regional organisations, such as the Secretariat of the Pacific Regional Environment Programme, the Asia–Pacific Network for Global Change Research and the Asia Pacific Economic Cooperation.

New Zealand's capacity building activities are targeted to areas where it has expertise, such as agriculture, renewable energy generation and disaster risk resilience building, and where countries have identified specific needs and capacity gaps. A large portion of New Zealand's capacity building activities has been aimed at the Pacific region, aligning with the Ministry of Foreign Affairs and Trade's strategic objective of maximising the impact of New Zealand's engagement in improving the prosperity, stability and resilience of the Pacific region and its people.[42] This also means New Zealand's capacity building support is focused on developing the needs of those with the least capacity – small island developing states, many of which are also those most vulnerable to climate change. Other capacity building activities where New Zealand has expertise have been delivered to the benefit of developing countries in Africa, South-East Asia and South America.

Capacity building supported through the New Zealand Aid Programme

Much of New Zealand's capacity building support for climate change adaptation, mitigation and technology transfer during the reporting period occurred through activities managed by the New Zealand Aid Programme as detailed in CTF tables 7b and the sections above that discuss regional and bilateral support. Examples in those sections and in CTF table 9 include: disaster risk management and resilience building; renewable energy; ocean acidification; drought resilience; agriculture; and support to developing countries to better access the finance needed for climate action, such as the Technical Assistance for Pacific Access programme, which provides rapid deployment of technical support to develop project proposals from the Pacific region.

Other capacity building support

New Zealand has also provided support to capacity building initiatives from other government funding sources. Some of this has been channelled through the Global Research Alliance on Agricultural Greenhouse Gases, the UNFCCC and regional organisations, such as the Secretariat of the Pacific Regional Environment Programme, the Asia–Pacific Network for Global Change Research and the APEC. As detailed in CTF table 9, during the reporting period, New Zealand:

- funded an NZ$43,157 workshop in 2015 to assist officials from Pacific Island countries to prepare their country's Intended Nationally Determined Contributions. It responded to needs identified by Pacific Island countries to help ensure their Intended Nationally Determined Contributions reflected Pacific priorities and capabilities. Pacific Island

[42] For further information see *MFAT Strategic Intentions 2016–20*. (10 September 2016). Retrieved from www.mfat.govt.nz/en/media-and-resources/news/mfat-strategic-intentions-2016-20/ (17 October 2017).

countries had the opportunity to exchange ideas and experiences, including learning from New Zealand's experience of preparing an Intended Nationally Determined Contribution. The workshop looked at emission reduction targets, data and policy processes and the importance of evidence-based information in annual greenhouse gas inventories, national communications and biennial reports

- provided SPREP with $20,000 to upskill Pacific Island country representatives in effective negotiating techniques ahead of the UNFCCC 20th Annual Conference of the Parties (COP20) climate change negotiations in 2014
- provided NZ$60,000 to the Asia–Pacific Network for Global Change Research for its CAPaBLE capacity building programme to enhance scientists', policy-makers' and other relevant stakeholders' capacity in the Asia–Pacific region. This enabled them to identify and assess global change issues at local, national and regional levels and further identify appropriate solutions and achieve sustainability
- provided, as detailed above in the section 'Multilateral support', NZ$444,000 to the UNFCCC to support: the international consultation and analysis processes in developing countries; the implementation of national greenhouse gas inventories by developing country Parties, including training in the use of the 2006 Intergovernmental Panel on Climate Change (IPCC) inventory guidelines; and the implementation of the Cancun Adaptation Framework and the Nairobi work programme on impacts, vulnerability and adaptation to climate change, all of which had significant capacity building elements
- contributed, as detailed above in the section 'Multilateral support', NZ$130,000 to the GEF's Capacity Building Initiative for Transparency (CBIT). Established at COP21, the CBIT will support developing country Parties to meet enhanced transparency requirements under the Paris Agreement
- provided NZ$8,331 support through the Global Research Alliance on Agricultural Greenhouse Gases to a World Food Programme and Food and Agriculture Organization agriculture inventory workshop delivered in South-East Asia. The workshop was designed to build capacity in how to implement the Enhanced Transparency Framework in agriculture and land-use sectors in Asia and the Pacific
- funded NZ$10,213 for officials from a range of Asian countries to learn about enteric fermentation in the agriculture sector. This workshop supports a climate and clean air coalition project that aims to identify practices and technologies to reduce livestock emissions while improving productivity
- provided NZ$661,521 to the Livestock Emissions Abatement Research Network (LEARN),[43] to support technicians, doctoral students and postdoctoral fellows from developing countries to build international capability in livestock emissions research
- provided NZ$128,134 for the World Farmers' Organisation and the Global Research Alliance on Agricultural Greenhouse Gases (WFO–GRA) study tours (see chapter 9 of New Zealand's *Seventh National Communication* to the UNFCCC)
- provided NZ$454,000 in capacity building and coordination support to Pacific Island countries through the New Zealand MetService to help ensure their National Meteorological Services (NMSs) are able to manage, operate and sustain their own Global Climate Observation Systems Essential Climate Variables observation programmes (for more information see Annex D: New Zealand's report on the Global Climate Observing System in New Zealand's *Seventh National Communication* to the UNFCCC).

[43] See www.livestockemissions.net for further information.

Fossil fuel subsidy reform

Capacity building that encourages the removal of environmentally harmful subsidies is critical to establishing environments that enable effective climate-friendly technology development and transfer, such as renewable energy technologies. Policies that encourage the removal of harmful subsidies are critical to implementing successful and sustainable fossil fuel subsidy reform. In some cases, building capacity to implement policies is thus necessary. As a founding member of the Friends of Fossil Fuel Subsidy Reform, New Zealand, alongside an informal group of non-Group of 20 countries, is building international political consensus on the importance of fossil fuel subsidy reform. In addition it is encouraging and building the capacity of the Group of 20 (G20) and APEC economies to meet their commitments to reform inefficient fossil fuel subsidies.

For example, in 2015 and 2016, New Zealand, with several other friends, supported the APEC capacity building workshops on fossil fuel subsidy reform. These workshops built developing country capacity by sharing experiences with domestic reform and/or fossil fuel subsidy peer reviews among APEC, G20 and other economies. It included perspectives from international experts on the best strategies for phasing out fossil fuel subsidies and effective ways to pursue reform while providing essential energy services. Other examples of capacity support provided through the Friends of Fossil Fuel Subsidy Reform during the reporting period were the 2015 and 2016 side events, hosted jointly by New Zealand, the United States and the World Bank, in the margins of the World Bank–International Monetary Fund Spring Meetings. The events provided an opportunity to hear first-hand accounts from countries about their experiences with reform, and to understand the tools and initiatives available to support reform.

CTF Table 9: Activities managed by the New Zealand Aid Programme that address capacity building

Recipient country or countries	Target area	Project title	Description
Papua New Guinea	Adaptation	Sustainable Agriculture and Community Resilience	Working with Caritas Aotearoa New Zealand to support sustainable agriculture and fishery-based alternative livelihoods for rural Papua New Guineans.
Vanuatu	Adaptation	Agricultural Development for Tanna's Economic Growth	The goal of the activity is to strengthen household economic resilience through developing the sustainable agricultural sector in Tanna, Vanuatu.
Vanuatu	Adaptation	Tanna WaSH Project	World Vision-led project focused on water, sanitation, hygiene, health and nutrition issues through community-led interventions in five communities in south-west Tanna, Vanuatu.
Pacific regional	Cross cutting	Green Climate Fund Technical Assistance for Pacific Access Programme	The overall goals of this activity are to: (1) build capacity and understanding of the Green Climate Fund; (2) identify current barriers preventing countries from readily accessing funds from the Green Climate Fund; (3) identify potential projects (in concept stage or in development) that meet the criteria of Green Climate Fund financing; and (4) support governments (and other regional stakeholders) to successfully gain financing for selected projects through the capacity building initiatives and the provision of specialist technical advice.

Recipient country or countries	Target area	Project title	Description
Pacific regional	Adaptation	Ocean Acidification	This activity aims to build community and environmental resilience to ocean acidification and is being led by SPREP.
Afghanistan	Mitigation	Renewable Energy Capability Building and Technical Support	This project contributed to growing the economy in Bamyan Province, Afghanistan, by providing capability building and technical assistance to ensure the successful long-term operation of the New Zealand-funded Renewable Energy Programme.
Indonesia	Mitigation	Geothermal Energy Human Resource Development	The activity produced a strategic geothermal energy human resource development plan for Indonesia's geothermal energy sector.
Indonesia	Energy Generation and Supply	GNS Geothermal Capacity Training	GNS Science in partnership with the University of Gadjah Mada is conducting basic and advance geothermal courses and developing training and course modules. Training of trainers is also being extended to lecturers of the University's Faculty of Engineering.
Laos	Adaptation	Resilience through Education	Working with Save the Children to support local communities and institutions to prepare for, respond to and recover from disasters. Disaster risk reduction plans to be prepared and implemented in communities and schools. Communities will also be strengthened through improved disaster-resilient livelihoods.
Philippines	Adaptation	BRAVE – Resilience and Food Security	Building resilience and improving food through three key output areas: disaster risk reduction, education and food security.
Timor Leste	Adaptation	Bobonaro Food Security and Economic Development	Working with World Vision to support farmers in Timor Leste to increase their yields of subsistence crops through the introduction of innovative, sustainable production, processing and storage techniques.
Viet Nam	Adaptation	Building strong and resilient communities	Working with ChildFund New Zealand to implement an activity to build stronger and more resilient communities in six rural communes in Cao Bang Province, through improved agriculture, diversified livelihoods and disaster risk management.
Asia regional	Adaptation	ASEAN Humanitarian Assistance Centre	Practical-level training and technical support to the ASEAN Humanitarian Assistance Centre in disaster risk management and risk identification.
Asia regional	Adaptation	ASEAN Humanitarian Assistance Centre Training Canterbury University	The activity delivered three two-week training courses in New Zealand for ASEAN officials working in disaster risk management.

Recipient country or countries	Target area	Project title	Description
Asia regional	Adaptation	Strengthening Disaster Risk Reduction: ADPC	The activity aims to improve disaster risk reduction capacity in Lao People's Democratic Republic (PDR), Myanmar, the Philippines and Viet Nam. It focuses on (1) improving the use of risk information and (2) enhancing preparedness for the recovery phase of disasters.
Papua New Guinea	Cross cutting	Drought Adaptation Strategies in Papua New Guinea Highlands	Provides immediate support to affected communities in Enga Province and potentially other areas affected by a prolonged drought as a result of the El Niño weather conditions in Papua New Guinea, by delivering agriculture drought strategies.
Tonga	Adaptation	SDF 3-201 Ama Takiloa Tonga Sustainable Development	The Ama Takiloa programme of the Tonga Community Development Trust worked with women's groups in villages on Tongatapu, 'Eua, Ha'apai, Vava'u and the Niuas to increase incomes, increase resilience to natural disasters and improve health.
Vanuatu	Adaptation	Water Supply Systems and Sector Strengthening	In partnership with the United Nations Children's Fund (UNICEF), New Zealand is funding technical advice to the Government of Vanuatu to strengthen information systems and the building of priority water and sanitation infrastructure.
Pacific regional	Adaptation	Pacific Disaster Risk Management	This activity aims to boost disaster readiness and response, principally in the Pacific.
Pacific regional	Adaptation	Meteorological Forecasting	This activity funds the New Zealand Meteorological Service to provide expert meteorological advice (relating to the annual Pacific cyclone season).
Pacific regional	Cross cutting	SPREP Programme Support	Support to build the capacity of SPREP, which is the regional organisation charged with the protection and sustainable development of the region's environment.
Indonesia	Adaptation	Disaster Risk Management: GNS – Reducing Risk from Disasters	Training and capability building provided to increase the disaster risk management skills of local governments, to provide specialist advice and technical support to local governments, and increase participation of the private sector, non-governmental organisations and community.
Indonesia	Cross cutting	Geo-INZ – Geothermal Technical Assistance	The provision of technical assistance embedded in the Indonesian Ministry of Energy and Mineral Resources at an operational level to support newly established Ministry in its responsibilities, including providing assistance in the tendering of geothermal concessions.
Indonesia	Mitigation	Geothermal training	New Zealand support for training in the Indonesia geothermal sector.

Recipient country or countries	Target area	Project title	Description
Laos	Adaptation	Community Resilience through Education	Improved risk and disaster recovery preparedness in seven districts in the Luang Prabang and Sayaboury provinces in Lao PDR.
Asia regional	Adaptation	ASEAN Humanitarian Assistance Centre	Practical training and technical support to the Humanitarian Assistance Centre in disaster risk management and risk identification.
Comoros	Mitigation	Support to attend a geothermal conference	Support to Comoros to attend a geothermal conference: 'Driving Geothermal Development: How to Realise Geothermal Potential'.
Africa regional	Mitigation	Renewable Energy Study Tour	Study tour to contribute to the development of the Africa Clean Energy Corridor, which will accelerate the use of renewable power in East Africa.
Central America region	Mitigation	Energy Summit Caribbean Attendance	Support for Caribbean delegations to attend at the Pacific Energy Summit.
West Indies regional	Mitigation	Caribbean Geothermal Workshop	A workshop on the development of geothermal energy in the Caribbean.

Note: ADPC = Asia Disaster Preparedness Centre; ASEAN = Association of South East Asian Nations; GCF = Green Climate Fund; GNS Science = Institute of Geological and Nuclear Sciences Limited; SPREP = Secretariat of the Pacific Regional Environment Programme; UNICEF = United Nations Children's Fund.

CTF Table 9: Capacity building activities funded from other sources

Recipient countries	Target area	Programme/project title	Description
Indonesia, Philippines, Sri Lanka, Viet Nam, Thailand	Cross cutting	Asian Inventory and Monitoring Workshop	This was a workshop organised by the Food and Agriculture Organization: 'On the Road to Enhanced Transparency for NDC Implementation: Understanding Capacity Needs for the Paris Enhanced Transparency Framework in Agriculture and Land-Use Sectors in Asia and the Pacific'.
India, Bangladesh, Japan, the Philippines, Indonesia, Thailand, Malaysia, Viet Nam	Mitigation	Enteric Methane Project	An Asia region workshop on enteric fermentation – to support Climate and Clean Air Coalition project.
Pacific Island countries	Cross cutting	Preparing Nationally Determined Contributions Workshop	A workshop to assist officials from Pacific Island countries to prepare their countries' Intended Nationally Determined Contributions.
Global	Cross cutting	Support to the UNFCCC	Support to the United Nations Framework Convention on Climate Change (UNFCCC) to assist developing countries to implement national greenhouse gas inventories, including training on the use of the 2006 IPCC inventory guidelines, and support the implementation of the Cancun Adaptation Framework and the Nairobi work programme on impacts, vulnerability and adaptation to climate change.

Recipient countries	Target area	Programme/project title	Description
Global	Cross cutting	Support to the Global Environment Fund Capacity Building Initiative for Transparency	Capacity building to support developing country Parties in meeting enhanced transparency arrangements under the Paris Agreement.
Asia–Pacific Economic Cooperation (APEC) developing countries	Mitigation	APEC Fossil Fuel Subsidy Reform capacity building workshops	Workshops supporting APEC developing country members' capacity building efforts to undertake fossil fuel subsidy reform.
Pakistan, Viet Nam, China, Sri Lanka, Ethiopia, Colombia, Kenya, Uganda, Ghana	Mitigation	Livestock Emissions Abatement Research Network	Support for technicians, doctoral students and postdoctoral fellows from developing countries to build international capability in livestock emissions research.
Argentina, Paraguay, South Africa and Uruguay	Cross cutting	World Farmers' Organisation–GRA study tours	Farmer study tour to raise awareness within the international farming community of the issue of greenhouse gases from agriculture, to provide a way for farmers to share experiences and to be informed of, and inform, the global research agenda.
Pacific Islands countries	Cross cutting	SPREP Negotiating Capacity Building	Capacity building event to up-skill officials and high level representatives from the Pacific region on climate change negotiations ahead of the UNFCCC 20th Annual Conference of the Parties (COP20).
Pacific Islands countries	Adaptation	Global Climate Observation Systems Essential Climate Variables observation programme	Capacity building and coordination support to Pacific Island Countries by MetService to help ensure their National Meteorological Services (NMSs) are able to manage, operate and sustain their own Global Climate Observation Systems Essential Climate Variables observation programmes, as detailed in Annex D: New Zealand's report on the Global Climate Observing System
Asia–Pacific	Cross cutting	CAPaBLE	Support for Asia–Pacific Network for Global Change Research and its capacity building programme CAPaBLE.
Global	Mitigation	Fossil Fuel Subsidy Reform	Encourage and support the G20 and APEC economies to reform inefficient fossil fuel subsidies.

Note: APEC = Asia–Pacific Economic Cooperation; COP20 = Conference of Parties 20; G20 = Group of 20; GRA = Global Research Alliance on Agricultural Greenhouse Gases; IPCC = Intergovernmental Panel on Climate Change; NDC = Nationally Determined Contribution; NMSs = National Meteorological Services; SPREP = Secretariat of the Pacific Regional Environment Programme; UNFCCC = United Nations Framework Convention on Climate Change.

Chapter VI: Other reporting matters

The Climate Change Response Act 2002[44] established the New Zealand Emissions Trading Scheme (NZ ETS). The NZ ETS places requirements on all sectors of the New Zealand economy to measure and report on emissions. Participants of the scheme, except those from the agriculture sector, must then surrender emission units corresponding to their reported emissions.

Audits are undertaken of participants' data to ensure their compliance with the NZ ETS. The Act provides for compliance action to enforce NZ ETS obligations, with a substantial financial penalty in addition to repayment of any outstanding emission units. Similar powers apply for any repayment obligations in case of over allocation.

The NZ ETS has continued to evolve since the publication of New Zealand's *Sixth National Communication*.[45] Most notably, this has been through barring the use of international units from June 2015. This transitioned the NZ ETS into a domestic-only scheme with only New Zealand Units and New Zealand-originated assigned amount units now eligible for surrender.

In July 2017, the Government completed a review of the NZ ETS. The aim of the review is to ensure the NZ ETS is fit for purpose to 2020 and can evolve to help New Zealand meet its post-2020 commitments.

The review followed a two-stage process, and the first stage concluded in May 2016 with a decision to phase out the one-for-two transitional measure from the NZ ETS. Outcomes from the second stage of the review concluded with in-principle decisions to improve the operation of the NZ ETS in the 2020s.

New Zealand publishes a domestic net position report, which tracks New Zealand's progress towards meeting its emission reduction targets. The report encompasses emissions and removals as presented in the annual greenhouse gas inventory, projections of emissions and removals to 2020, and units held by the Government. The report is published on the Ministry for the Environment's website.[46]

---

[44] The Climate Change Response Act 2002 sets out all the legislated obligations and requirements referred to in this chapter. See www.legislation.govt.nz/act/public/2002/0040/latest/DLM158584.html for further information.

[45] For a copy of the *Sixth National Communication*, see the Ministry for the Environment's website, www.mfe.govt.nz/publications/climate-change/new-zealands-sixth-national-communication-under-united-nations-framework.

[46] For the latest update on New Zealand's 2020 net position see www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/latest-2020-net-position.

Annex A: CTF Table 1

CTF Table 1: Emission trends (CO_2 – Part 1 of 3)

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
1. Energy	22,491.81	22,998.88	24,864.09	24,317.58	24,555.78	24,641.75	25,903.73	27,943.23	26,376.11	27,711.94
A. Fuel combustion (sectoral approach)	22,032.08	22,443.94	24,323.73	23,799.01	24,014.94	24,141.39	25,237.12	27,213.59	25,668.39	27,095.78
1. Energy industries	5,983.74	6,097.05	7,585.40	6,648.46	5,534.96	4,805.39	5,554.56	7,160.68	5,576.06	6,795.16
2. Manufacturing industries and construction	4,678.70	5,161.47	5,013.26	5,282.43	5,599.97	5,701.84	6,048.60	6,137.15	5,876.40	5,732.16
3. Transport	8,581.99	8,575.87	8,946.43	9,406.45	10,074.13	10,745.86	10,889.98	11,120.77	11,339.49	11,633.64
4. Other sectors	2,787.64	2,609.55	2,778.65	2,461.67	2,805.88	2,888.30	2,743.99	2,795.00	2,876.43	2,934.82
5. Other										
B. Fugitive emissions from fuels	459.73	554.94	540.36	518.57	540.84	500.37	666.61	729.64	707.73	616.16
1. Solid fuels	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE
2. Oil and natural gas and other emissions from energy production	459.73	554.94	540.36	518.57	540.84	500.37	666.61	729.64	707.73	616.16
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Industrial processes	2,524.39	2,663.99	2,762.17	2,852.21	2,730.55	2,818.91	2,831.21	2,737.46	2,797.51	2,949.65
A. Mineral industry	561.87	572.41	648.54	646.71	625.40	674.60	646.19	695.08	650.96	728.35
B. Chemical industry	175.40	189.82	181.80	179.40	196.23	171.54	190.79	190.39	195.43	196.71
C. Metal industry	1,757.51	1,872.16	1,901.17	1,994.16	1,874.88	1,936.83	1,957.86	1814.77	1,913.27	1,985.89
D. Non-energy products from fuels and solvent use	29.61	29.61	30.67	31.93	34.05	35.95	36.37	37.22	37.85	38.70
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H. Other										

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
3. Agriculture	399.26	440.54	468.46	522.45	588.09	677.93	627.06	662.41	747.90	855.03
A. Enteric fermentation										
B. Manure management										
C. Rice cultivation										
D. Agricultural soils										
E. Prescribed burning of savannas										
F. Field burning of agricultural residues										
G. Liming	360.06	388.70	417.33	451.95	496.55	541.15	485.22	534.62	584.01	633.41
H. Urea application	39.19	51.84	51.13	70.49	91.54	136.78	141.84	127.79	163.89	221.62
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
J. Other										
4. Land use, land-use change and forestry[(2)]	–30,392.73	–32,385.06	–31,886.49	–32,550.78	–32,614.53	–31,160.37	–30,745.91	–31,750.69	–32,185.85	–33,759.36
A. Forest land	–29,954.39	–31,056.57	–30,465.78	–30,881.86	–30,551.32	–28,871.58	–28,601.32	–29,257.96	–31,054.43	–31,382.66
B. Cropland	469.34	471.72	474.09	476.47	478.84	481.21	483.59	487.59	490.09	492.60
C. Grassland	762.32	832.81	897.58	1,013.81	1,130.91	1,237.18	1,337.69	1,456.79	1,552.50	1,651.62
D. Wetlands	–20.35	–19.26	–18.18	–17.09	–16.01	–14.93	–13.84	–12.69	–11.61	–10.53
E. Settlements	67.71	69.27	70.84	72.70	75.23	78.46	80.74	83.17	85.39	86.71
F. Other land	10.87	11.63	12.39	13.15	13.91	14.67	15.43	16.81	17.72	18.63
G. Harvested wood products	–1,728.24	–2,694.65	–2,857.44	–3,227.94	–3,746.09	–4,085.39	–4,048.20	–4,524.41	–3,265.50	–4,615.73
H. Other										

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
5. Waste	13.18	13.18	13.18	13.17	13.05	13.05	12.88	12.51	12.51	12.31
A. Solid waste disposal	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
B. Biological treatment of solid waste										
C. Incineration and open burning of waste	13.18	13.18	13.18	13.17	13.05	13.05	12.88	12.51	12.51	12.31
D. Waste water treatment and discharge										
E. Other										
6. Other *(as specified in summary 1.A)*										
Total CO_2 equivalent emissions without land use, land-use change and forestry	25,428.64	26,116.59	28,107.90	27,705.40	27,887.47	28,151.65	29,374.88	31,355.60	29,934.03	31,528.93
Total CO_2 equivalent emissions with land use, land-use change and forestry	–4,964.09	–6,268.47	–3,778.59	–4,845.38	–4,727.06	–3,008.72	–1,371.03	–395.09	–2,251.82	–2,230.43
Memo items:										
International bunkers	2,364.07	2,222.17	2,134.61	2,210.24	2,660.07	2,748.56	2,718.80	2,759.39	2,857.03	2,762.58
Aviation	1,321.65	1,282.16	1,258.35	1,284.21	1,281.41	1,601.89	1,627.38	1,628.90	1,770.22	1,836.55
Navigation	1,042.42	940.01	876.27	926.03	1,378.66	1,146.66	1,091.43	1,130.49	1,086.82	926.03
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass	3,516.11	3,592.45	3,592.72	3,785.48	3,973.81	4,089.94	3,925.05	4,122.61	4,376.71	4,856.44
CO_2 captured	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Long-term storage of C in waste disposal sites	3,725.86	3,926.42	4,126.97	4,358.04	4,594.29	4,830.55	5,073.45	5,307.41	5,527.91	5,748.42
Indirect N_2O										

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
Indirect CO_2[3]	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

CTF Table 1: Emission trends (CO_2 – Part 2 of 3)

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
1. Energy	28,507.69	30,552.52	30,599.97	32,207.16	31,792.36	33,228.27	33,286.05	32,147.74	33,448.87	30,668.86
A. Fuel combustion (sectoral approach)	27,914.43	29,931.00	30,005.82	31,595.91	30,929.04	32,313.02	32,325.65	31,126.31	32,206.60	29,300.57
1. Energy industries	6,452.73	7,956.21	7,179.51	8,514.75	8,131.78	10,195.40	10,091.44	8,459.30	9,636.25	7,421.93
2. Manufacturing industries and construction	6,252.16	6,630.39	6,891.14	6,337.81	5,809.03	4,993.36	5,046.24	5,484.09	5,489.67	5,226.54
3. Transport	12,187.48	12,259.39	12,722.73	13,267.28	13,569.78	13,656.23	13,795.12	13,915.74	13,949.47	13,774.21
4. Other sectors	3,022.05	3,085.02	3,212.44	3,476.07	3,418.45	3,468.04	3,392.85	3,267.19	3,131.21	2,877.89
5. Other										
B. Fugitive emissions from fuels	593.26	621.53	594.15	611.25	863.32	915.25	960.40	1,021.42	1,242.26	1,368.29
1. Solid fuels	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA ,NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE
2. Oil and natural gas and other emissions from energy production	593.26	621.53	594.15	611.25	863.32	915.25	960.40	1,021.42	1,242.26	1,368.29
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
2. Industrial processes	2,927.92	2,992.48	2,990.45	3,158.91	3,137.67	3,214.79	3,187.07	3,383.17	3,165.02	3,027.99
A. Mineral industry	718.54	716.89	706.97	697.26	666.68	756.18	719.14	861.50	807.03	752.17
B. Chemical industry	198.26	206.31	213.07	201.42	194.29	229.12	243.05	249.96	265.66	261.66
C. Metal industry	1,970.95	2,028.69	2,028.55	2,216.67	2,232.09	2,184.66	2,179.63	2,226.05	2,046.67	1,969.13
D. Non-energy products from fuels and solvent use	40.18	40.60	41.87	43.56	44.61	44.82	45.25	45.67	45.67	45.04
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H. Other										
3. Agriculture	911.35	1,031.04	1,171.91	1,123.45	1,125.25	1,194.38	1,038.67	1,111.52	1,051.17	1,093.61
A. Enteric fermentation										
B. Manure management										
C. Rice cultivation										
D. Agricultural soils										
E. Prescribed burning of savannas										
F. Field burning of agricultural residues										
G. Liming	682.80	732.20	781.59	689.34	670.21	737.78	616.41	655.22	610.84	719.70
H. Urea application	228.54	298.84	390.32	434.11	455.04	456.60	422.26	456.29	440.33	373.91
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
J. Other										

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
4. Land use, land-use change and forestry[2]	–32,655.75	–32,032.85	–29,618.15	–30,738.79	–30,727.33	–29,130.37	–27,488.35	–25,390.28	–33,898.04	–30,557.95
A. Forest land	–31,882.61	–30,773.53	–27,275.67	–30,243.53	–34,084.51	–37,747.60	–38,306.62	–41,107.89	–33,165.76	–33,133.37
B. Cropland	509.89	511.80	509.75	526.68	555.46	607.80	634.51	682.94	495.12	475.98
C. Grassland	3,565.26	3,601.76	3,387.16	5,031.15	7,854.86	12,834.98	15,361.70	20,323.47	4,264.46	7,593.74
D. Wetlands	–8.77	–7.71	–6.85	–5.08	–2.74	0.74	2.90	6.22	9.43	15.54
E. Settlements	100.21	100.89	99.51	113.94	137.84	181.56	203.79	245.12	76.67	99.65
F. Other land	37.82	38.66	37.05	49.91	71.62	103.46	123.48	161.53	47.86	117.22
G. Harvested wood products	–4,977.56	–5,504.72	–6,369.10	–6,211.86	–5,259.85	–5,111.31	–5,508.11	–5,701.68	–5,625.82	–5,726.70
H. Other										
5. Waste	11.68	11.03	6.17	5.58	5.04	4.98	3.91	2.69	1.21	1.21
A. Solid waste disposal	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
B. Biological treatment of solid waste										
C. Incineration and open burning of waste	11.68	11.03	6.17	5.58	5.04	4.98	3.91	2.69	1.21	1.21
D. Waste water treatment and discharge										
E. Other										
6. Other *(as specified in summary 1.A)*										
Total CO_2 equivalent emissions without land use, land-use change and forestry	32,358.64	34,587.07	34,768.50	36,495.10	36,060.32	37,642.41	37,515.69	36,645.12	37,666.27	34,791.66
Total CO_2 equivalent emissions with land use, land-use change and forestry	–297.12	2,554.22	5,150.35	5,756.31	5,333.00	8,512.04	10,027.34	1,1254.84	3,768.23	4,233.72

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
Memo items:										
International bunkers	2,555.31	2762.57	2,832.51	2,865.86	2,964.04	3,200.74	3,146.78	3,276.34	3,418.70	3,325.51
Aviation	1,800.08	1,943.22	1,933.98	2,002.37	2,228.09	2,210.89	2,180.08	2,287.52	2,304.12	2,308.01
Navigation	755.24	819.35	898.53	863.49	735.95	989.85	966.70	988.82	1,114.58	1,017.50
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass	5,302.66	5,250.10	5,645.96	5,689.47	6,113.37	6,083.84	6,048.76	5,798.31	5,403.89	5,012.63
CO_2 captured	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Long-term storage of C in waste disposal sites	5,968.92	6,209.48	6,449.47	6,677.22	6,911.93	7,175.29	7,498.05	7,800.28	8,093.91	8,381.14
Indirect N_2O										
Indirect CO_2[(3)]	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

CTF Table 1: Emission trends (CO_2 – Part 3 of 3)

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
1. Energy	30,622.47	29,900.44	31,216.45	30,701.37	31,080.86	31,252.79	38.95
A. Fuel combustion (sectoral approach)	29,116.77	28,443.40	29,944.28	29,630.67	29,846.37	29,813.50	35.32
1. Energy industries	6,804.58	6,304.36	7,693.47	6,396.23	5,418.90	5,279.86	–11.76
2. Manufacturing industries and construction	5,482.30	5,155.42	5,256.98	6,157.48	7,132.79	6,701.82	43.24
3. Transport	13,945.98	13,954.87	13,723.37	13,940.35	14,008.15	14,593.57	70.05
4. Other sectors	2,883.92	3,028.74	3,270.45	3,136.61	3,286.53	3,238.25	16.16
5. Other							
B. Fugitive emissions from fuels	1,505.70	1,457.04	1,272.17	1,070.70	1,234.49	1,439.29	213.07
1. Solid fuels	NO, NA, NE	NO, NA, NE	NO, NA, NE	NO, NA, NE	NE, NA, NO	NE, NA, NO	0.00
2. Oil and natural gas and other emissions from energy production	1,505.70	1,457.04	1,272.17	1,070.70	1,234.49	1,439.29	213.07
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NO	0.00
2. Industrial processes	3,324.23	3,299.07	3,260.06	3,324.11	3,400.22	3,512.93	39.16
A. Mineral industry	740.23	713.26	751.88	774.42	830.50	876.33	55.97
B. Chemical industry	265.10	281.55	275.21	260.53	253.57	282.35	60.97
C. Metal industry	2,273.23	2,258.88	2,187.58	2,243.77	2,270.77	2,307.74	31.31
D. Non-energy products from fuels and solvent use	45.67	45.39	45.39	45.39	45.39	46.51	57.07
E. Electronic industry							
F. Product uses as ODS substitutes							
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	0.00
H. Other							

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
3. Agriculture	1,069.83	1,131.49	1,176.95	1,060.25	1,102.69	1,144.50	186.66
A. Enteric fermentation							
B. Manure management							
C. Rice cultivation							
D. Agricultural soils							
E. Prescribed burning of savannas							
F. Field burning of agricultural residues							
G. Liming	620.47	634.49	682.71	540.07	591.98	536.27	48.94
H. Urea application	449.36	497.00	494.24	520.18	510.71	608.23	1,451.81
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	0.00
J. Other							
4. Land use, land-use change and forestry(2)	–30,875.42	–26,385.50	–25,709.02	–24,362.89	–23,990.21	–23,964.01	–21.15
A. Forest land	–32,762.45	–26,373.04	–25,805.42	–23,732.57	–24,320.59	–23,466.61	–21.66
B. Cropland	475.92	466.57	483.08	544.80	466.72	444.36	–5.32
C. Grassland	7,858.13	6,362.18	7,139.91	7,378.38	7,368.00	4,595.69	502.85
D. Wetlands	3.26	1.16	0.61	1.03	10.42	1.85	–109.08
E. Settlements	87.89	99.12	91.74	80.94	78.92	85.76	26.66
F. Other land	124.08	194.18	189.67	132.00	130.18	144.68	1,231.01
G. Harvested wood products	–6,662.24	–7,135.67	–7,808.61	–8,767.47	–7,723.86	–5,769.73	233.85
H. Other							
5. Waste	1.21	1.21	1.21	1.21	1.21	1.21	–90.82
A. Solid waste disposal	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
B. Biological treatment of solid waste							

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
C. Incineration and open burning of waste	1.21	1.21	1.21	1.21	1.21	1.21	–90.82
D. Waste water treatment and discharge							
E. Other							
6. Other *(as specified in summary 1.A)*							
Total CO_2 equivalent emissions without land use, land-use change and forestry	35,017.74	34,332.22	35,654.67	35,086.94	35,584.98	35,911.43	41.22
Total CO_2 equivalent emissions with land use, land-use change and forestry	4,142.31	7,946.72	9,945.64	10,724.05	11,594.78	11,947.43	–340.68
Memo items:							
International bunkers	3,384.94	3,435.60	3,474.44	3,461.36	3,502.90	3,792.92	60.44
Aviation	2,317.90	2,417.85	2,504.37	2,500.95	2,575.42	2,765.83	109.27
Navigation	1,067.03	1,017.75	970.07	960.40	927.48	1,027.09	–1.47
Multilateral operations	NO	NO	NO	NO	NO	NO	0.00
CO_2 emissions from biomass	5,615.00	5,691.12	5,659.37	5,374.65	5,404.27	5,443.38	54.81
CO_2 captured	NO	NO	NO	NO	NO	NO	0.00
Long-term storage of C in waste disposal sites	8,681.67	8,991.99	9,312.09	9,642.35	9,972.60	10,302.80	176.52
Indirect N_2O							
Indirect CO_2 [(3)]	NO, NE	NO, NE	NO, NE	NO, NE	NE, NO	NE, NO	0.00
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	35,017.74	34,332.22	35,654.67	35,086.94	35,584.98	35,911.43	41.22
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	4,142.31	7,946.72	9,945.64	10,724.05	1,1594.78	1,1947.43	–340.68

CTF Table 1: Emission trends (CH_4 – Part 1 of 3)

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
1. Energy	42.55	37.82	38.66	37.72	39.00	39.59	48.80	44.31	45.44	48.70
A. Fuel combustion (sectoral approach)	7.47	7.06	6.77	6.60	6.79	6.80	6.63	6.65	6.59	6.54
1. Energy industries	0.10	0.10	0.13	0.11	0.09	0.08	0.09	0.12	0.09	0.11
2. Manufacturing industries and construction	1.06	1.08	1.10	1.15	1.19	1.20	1.17	1.21	1.25	1.35
3. Transport	2.88	2.80	2.75	2.69	2.65	2.63	2.52	2.47	2.38	2.30
4. Other sectors	3.44	3.08	2.79	2.65	2.85	2.89	2.85	2.86	2.86	2.77
5. Other										
B. Fugitive emissions from fuels	35.08	30.76	31.89	31.12	32.21	32.78	42.16	37.66	38.86	42.16
1. Solid fuels	13.13	8.80	8.99	8.72	10.27	12.97	19.17	13.52	15.58	17.16
2. Oil and natural gas and other emissions from energy production	21.95	21.95	22.90	22.40	21.94	19.81	23.00	24.14	23.27	25.00
C. CO_2 transport and storage										
2. Industrial processes	1.10	1.89	1.60	1.79	2.25	3.16	4.25	4.38	4.12	4.74
A. Mineral industry										
B. Chemical industry	1.10	1.89	1.60	1.79	2.25	3.16	4.25	4.38	4.12	4.74
C. Metal industry	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
D. Non-energy products from fuels and solvent use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H. Other										

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
3. Agriculture	1,096.97	1,105.66	1,089.63	1,088.41	1,117.85	1,130.51	1,142.29	1,169.85	1,139.76	1,146.73
A. Enteric fermentation	1,068.62	1,076.80	1,060.62	1,058.75	1,086.82	1,098.57	1,109.16	1,135.55	1,106.07	1,113.04
B. Manure management	27.44	28.06	28.25	28.79	30.10	31.14	32.21	33.25	32.75	32.75
C. Rice cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
E. Prescribed burning of savannas	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
F. Field burning of agricultural residues	0.90	0.80	0.76	0.87	0.92	0.80	0.92	1.05	0.94	0.94
G. Liming										
H. Urea application										
I. Other carbon-containing fertilizers										
J. Other										
4. Land use, land-use change and forestry(2)	3.73	3.18	3.55	4.15	4.17	4.47	4.92	4.43	5.49	3.66
A. Forest land	0.94	0.82	1.15	1.13	1.35	2.01	2.05	1.95	1.45	1.07
B. Cropland	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE
C. Grassland	2.79	2.36	2.40	3.01	2.82	2.46	2.87	2.48	4.04	2.60
D. Wetlands	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
E. Settlements	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA
F. Other land	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA
G. Harvested wood products										
H. Other										

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
5. Waste	160.27	164.03	167.45	170.85	168.21	170.63	173.05	174.87	175.88	177.32
A. Solid waste disposal	150.74	154.19	157.61	160.86	158.06	160.21	162.53	164.24	165.48	167.19
B. Biological treatment of solid waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Waste water treatment and discharge	9.53	9.84	9.84	9.99	10.14	10.42	10.52	10.63	10.40	10.12
E. Other										
6. Other *(as specified in summary 1.A)*										
Total CH_4 emissions without CH_4 from LULUCF	1,300.89	1,309.40	1,297.34	1,298.77	1,327.30	1,343.89	1,368.38	1,393.42	1,365.21	1,377.49
Total CH_4 emissions with CH_4 from LULUCF	1,304.62	1,312.58	1,300.89	1,302.92	1,331.47	1,348.36	1,373.30	1,397.85	1,370.69	1,381.15
Memo items:										
International bunkers	0.09	0.08	0.08	0.08	0.12	0.10	0.10	0.10	0.10	0.09
Aviation	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Navigation	0.08	0.07	0.07	0.07	0.11	0.09	0.09	0.09	0.09	0.08
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass										
CO_2 captured										
Long-term storage of C in waste disposal sites										
Indirect N_2O										
Indirect CO_2(3)										

CTF Table 1: Emission trends (CH_4 – Part 2 of 3)

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
1. Energy	48.54	49.67	48.24	42.71	40.14	40.48	45.03	39.73	44.16	46.48
A. Fuel combustion (sectoral approach)	6.61	6.57	6.60	6.63	6.59	6.66	6.66	6.34	6.14	5.73
1. Energy industries	0.11	0.13	0.12	0.13	0.12	0.15	0.14	0.13	0.14	0.11
2. Manufacturing industries and construction	1.49	1.52	1.63	1.66	1.72	1.68	1.68	1.64	1.55	1.39
3. Transport	2.20	2.18	2.12	2.04	1.95	1.84	1.71	1.63	1.52	1.44
4. Other sectors	2.81	2.74	2.73	2.79	2.80	2.98	3.12	2.93	2.93	2.79
5. Other										
B. Fugitive emissions from fuels	41.92	43.10	41.64	36.08	33.54	33.82	38.37	33.39	38.03	40.75
1. Solid fuels	16.86	17.08	16.98	15.98	15.00	15.87	20.19	12.93	16.29	19.34
2. Oil and natural gas and other emissions from energy production	25.06	26.03	24.66	20.10	18.54	17.95	18.18	20.46	21.74	21.41
C. CO_2 transport and storage										
2. Industrial processes	5.54	4.90	5.25	2.23	2.50	0.79	0.93	1.00	1.31	1.89
A. Mineral industry										
B. Chemical industry	5.54	4.90	5.25	2.23	2.50	0.79	0.93	1.00	1.31	1.89
C. Metal industry	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
D. Non-energy products from fuels and solvent use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H. Other										

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
3. Agriculture	1,178.24	1,183.50	1,180.52	1,200.03	1,199.06	1,210.68	1,215.03	1,170.66	1,126.15	1,140.68
A. Enteric fermentation	1,142.67	1,146.45	1,142.69	1,160.91	1,159.70	1,171.04	1,174.92	1,130.75	1,086.34	1,099.30
B. Manure management	34.63	36.01	36.80	38.14	38.63	38.75	39.29	38.88	38.92	40.46
C. Rice cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural soils	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
E. Prescribed burning of savannas	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
F. Field burning of agricultural residues	0.94	1.04	1.03	0.98	0.73	0.88	0.82	1.02	0.90	0.92
G. Liming										
H. Urea application										
I. Other carbon-containing fertilizers										
J. Other										
4. Land use, land-use change and forestry(2)	3.47	3.44	3.40	3.69	3.58	5.54	5.93	7.84	3.48	4.47
A. Forest land	1.07	0.91	0.81	0.68	0.60	0.57	0.61	0.88	0.74	0.98
B. Cropland	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE
C. Grassland	2.40	2.53	2.60	3.01	2.98	4.97	5.32	6.96	2.75	3.49
D. Wetlands	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
E. Settlements	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA
F. Other land	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA
G. Harvested wood products										
H. Other										

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
5. Waste	179.56	181.64	183.46	181.40	182.03	182.80	179.71	179.00	176.33	174.30
A. Solid waste disposal	169.44	171.60	173.53	171.36	172.10	172.94	170.26	169.57	166.73	164.95
B. Biological treatment of solid waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Waste water treatment and discharge	10.12	10.03	9.93	10.04	9.93	9.85	9.45	9.43	9.60	9.34
E. Other										
6. Other *(as specified in summary 1.A)*										
Total CH_4 emissions without CH_4 from LULUCF	1,411.88	1,419.71	1,417.46	1,426.36	1,423.73	1,434.74	1,440.70	1,390.39	1,347.96	1,363.35
Total CH_4 emissions with CH_4 from LULUCF	1,415.35	1,423.15	1,420.87	1,430.05	1,427.30	1,440.28	1,446.62	1,398.23	1,351.44	1,367.82
Memo items:										
International bunkers	0.08	0.08	0.09	0.09	0.08	0.10	0.10	0.10	0.11	0.10
Aviation	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02
Navigation	0.06	0.07	0.08	0.07	0.06	0.09	0.08	0.09	0.10	0.09
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass										
CO_2 captured										
Long-term storage of C in waste disposal sites										
Indirect N_2O										
Indirect CO_2[(3)]										

CTF Table 1: Emission trends (CH_4 – Part 3 of 3)

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
1. Energy	51.43	44.01	39.13	37.74	37.25	38.13	–10.39
A. Fuel combustion (sectoral approach)	6.02	6.20	6.32	6.04	5.64	5.66	–24.20
1. Energy industries	0.11	0.10	0.12	0.10	0.09	0.08	–15.15
2. Manufacturing industries and construction	1.56	1.56	1.55	1.52	1.56	1.56	48.19
3. Transport	1.37	1.29	1.22	1.19	1.15	1.08	–62.40
4. Other sectors	2.97	3.26	3.43	3.23	2.85	2.93	–14.69
5. Other							
B. Fugitive emissions from fuels	45.41	37.81	32.82	31.70	31.61	32.47	–7.45
1. Solid fuels	23.44	16.58	11.52	10.83	9.01	7.59	–42.18
2. Oil and natural gas and other emissions from energy production	21.97	21.23	21.29	20.87	22.60	24.87	13.33
C. CO_2 transport and storage							
2. Industrial processes	1.91	1.92	2.55	3.27	5.06	4.27	286.60
A. Mineral industry							
B. Chemical industry	1.91	1.92	2.55	3.27	5.06	4.27	286.60
C. Metal industry	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
D. Non-energy products from fuels and solvent use	NA	NA	NA	NA	NA	NA	0.00
E. Electronic industry							
F. Product uses as ODS substitutes							
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	0.00
H. Other							

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
3. Agriculture	1,138.48	1,155.21	1,180.74	1,183.80	1,191.48	1,170.51	6.70
A. Enteric fermentation	1,095.93	1,111.28	1,135.15	1,137.38	1,143.95	1,123.63	5.15
B. Manure management	41.54	43.17	44.47	45.30	46.57	46.14	68.13
C. Rice cultivation	NO	NO	NO	NO	NO	NO	0.00
D. Agricultural soils	NE	NE	NE	NE	NE	NE	0.00
E. Prescribed burning of savannas	IE	IE	IE	IE	IE	IE	0.00
F. Field burning of agricultural residues	1.01	0.75	1.12	1.12	0.96	0.75	–17.61
G. Liming							
H. Urea application							
I. Other carbon-containing fertilizers							
J. Other							
4. Land use, land-use change and forestry[(2)]	4.41	3.18	3.38	3.11	3.19	3.17	–14.87
A. Forest land	0.83	0.84	0.73	0.61	0.69	1.42	50.52
B. Cropland	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	NE, IE	0.00
C. Grassland	3.58	2.33	2.65	2.49	2.50	1.76	–36.95
D. Wetlands	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	0.00
E. Settlements	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	0.00
F. Other land	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	0.00
G. Harvested wood products							
H. Other							
5. Waste	170.06	165.49	162.64	159.53	158.22	154.77	–3.43
A. Solid waste disposal	160.73	156.15	152.81	150.13	148.65	145.03	–3.78
B. Biological treatment of solid waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	0.00

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	–87.32
D. Waste water treatment and discharge	9.33	9.34	9.83	9.41	9.57	9.73	2.13
E. Other							
6. Other *(as specified in summary 1.A)*							
Total CH_4 emissions without CH_4 from LULUCF	1,361.87	1,366.63	1,385.05	1,384.33	1,392.01	1,367.68	5.13
Total CH_4 emissions with CH_4 from LULUCF	1,366.28	1,369.81	1,388.44	1,387.44	1,395.20	1,370.85	5.08
Memo items:							
International bunkers	0.11	0.11	0.10	0.10	0.10	0.11	21.38
Aviation	0.02	0.02	0.02	0.02	0.02	0.02	107.46
Navigation	0.09	0.09	0.08	0.08	0.08	0.09	11.38
Multilateral operations	NO	NO	NO	NO	NO	NO	0.00
CO_2 emissions from biomass							
CO_2 captured							
Long-term storage of C in waste disposal sites							
Indirect N_2O							
Indirect CO_2[3]							

CTF Table 1: Emission trends (N_2O – Part 1 of 3)

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
1. Energy	0.65	0.66	0.71	0.72	0.78	0.80	0.79	0.83	0.84	0.89
A. Fuel combustion (sectoral approach)	0.65	0.65	0.71	0.72	0.78	0.80	0.79	0.83	0.84	0.88
1. Energy industries	0.02	0.01	0.03	0.02	0.01	0.02	0.02	0.03	0.02	0.03
2. Manufacturing industries and construction	0.16	0.16	0.17	0.17	0.18	0.18	0.18	0.18	0.18	0.20
3. Transport	0.37	0.39	0.41	0.44	0.47	0.50	0.50	0.53	0.54	0.56
4. Other sectors	0.10	0.09	0.10	0.09	0.11	0.11	0.09	0.10	0.09	0.10
5. Other										
B. Fugitive emissions from fuels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1. Solid fuels	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
2. Oil and natural gas and other emissions from energy production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. CO_2 transport and storage										
2. Industrial processes	0.34	0.33	0.31	0.29	0.28	0.27	0.25	0.24	0.23	0.22
A. Mineral industry										
B. Chemical industry	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
C. Metal industry										
D. Non-energy products from fuels and solvent use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	0.34	0.33	0.31	0.29	0.28	0.27	0.25	0.24	0.23	0.22
H. Other										

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
3. Agriculture	17.78	18.08	18.25	18.90	19.48	20.28	20.72	21.22	20.91	21.14
A. Enteric fermentation										
B. Manure management	0.18	0.19	0.19	0.19	0.20	0.22	0.22	0.23	0.23	0.22
C. Rice cultivation										
D. Agricultural soils	17.59	17.88	18.05	18.69	19.26	20.05	20.48	20.98	20.67	20.90
E. Prescribed burning of savannas	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
F. Field burning of agricultural residues	0.02	0.01	0.01	0.02	0.02	0.01	0.02	0.02	0.02	0.02
G. Liming										
H. Urea application										
I. Other carbon-containing fertilizers										
J. Other										
4. Land use, land-use change and forestry(2)	0.59	0.59	0.60	0.62	0.65	0.66	0.68	0.69	0.70	0.68
A. Forest land	0.41	0.42	0.45	0.48	0.53	0.55	0.56	0.57	0.57	0.56
B. Cropland	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04
C. Grassland	0.16	0.14	0.12	0.11	0.09	0.08	0.09	0.08	0.09	0.07
D. Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E. Settlements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F. Other land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Harvested wood products										
H. Other										
5. Waste	0.33	0.34	0.34	0.35	0.35	0.36	0.36	0.36	0.37	0.37
A. Solid waste disposal										

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
B. Biological treatment of solid waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
C. Incineration and open burning of waste	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
D. Waste water treatment and discharge	0.32	0.33	0.34	0.34	0.35	0.35	0.36	0.36	0.36	0.36
E. Other										
6. Other *(as specified in summary 1.A)*										
Total CH_4 emissions without CH_4 from LULUCF	19.10	19.40	19.61	20.26	20.89	21.70	22.12	22.66	22.34	22.61
Total CH_4 emissions with CH_4 from LULUCF	19.70	19.99	20.21	20.87	21.54	22.36	22.81	23.35	23.04	23.28
Memo items:										
International bunkers	0.08	0.07	0.07	0.07	0.09	0.09	0.08	0.08	0.08	0.08
Aviation	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05
Navigation	0.04	0.04	0.03	0.03	0.05	0.04	0.04	0.04	0.04	0.03
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass										
CO_2 captured										
Long-term storage of C in waste disposal sites										
Indirect N_2O	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO
Indirect CO_2(3)										

CTF Table 1: Emission trends (N_2O – Part 2 of 3)

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
1. Energy	0.94	0.95	0.99	1.06	1.11	1.12	1.10	1.05	1.03	0.96
A. Fuel combustion (sectoral approach)	0.94	0.95	0.99	1.06	1.11	1.12	1.10	1.05	1.03	0.96
1. Energy industries	0.02	0.03	0.03	0.06	0.07	0.09	0.08	0.05	0.07	0.05
2. Manufacturing industries and construction	0.22	0.22	0.24	0.25	0.26	0.25	0.25	0.25	0.24	0.22
3. Transport	0.61	0.60	0.62	0.65	0.67	0.67	0.65	0.64	0.61	0.60
4. Other sectors	0.10	0.10	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.10
5. Other										
B. Fugitive emissions from fuels	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1. Solid fuels	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
2. Oil and natural gas and other emissions from energy production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C. CO_2 transport and storage										
2. Industrial processes	0.21	0.20	0.19	0.18	0.16	0.15	0.14	0.15	0.18	0.18
A. Mineral industry										
B. Chemical industry	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
C. Metal industry										
D. Non-energy products from fuels and solvent use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E. Electronic industry										
F. Product uses as ODS substitutes										
G. Other product manufacture and use	0.21	0.20	0.19	0.18	0.16	0.15	0.14	0.15	0.18	0.18
H. Other										

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
3. Agriculture	22.48	23.59	24.39	25.16	25.42	25.68	25.42	24.34	24.35	24.18
A. Enteric fermentation										
B. Manure management	0.23	0.24	0.25	0.26	0.27	0.26	0.26	0.27	0.27	0.27
C. Rice cultivation										
D. Agricultural soils	22.23	23.33	24.13	24.89	25.14	25.41	25.14	24.06	24.07	23.89
E. Prescribed burning of savannas	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
F. Field burning of agricultural residues	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.02	0.02
G. Liming										
H. Urea application										
I. Other carbon-containing fertilizers										
J. Other										
4. Land use, land-use change and forestry(2)	0.67	0.66	0.64	0.63	0.60	0.59	0.57	0.58	0.53	0.51
A. Forest land	0.56	0.55	0.53	0.51	0.48	0.45	0.43	0.42	0.41	0.40
B. Cropland	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
C. Grassland	0.08	0.07	0.07	0.07	0.07	0.08	0.09	0.10	0.07	0.06
D. Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E. Settlements	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F. Other land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
G. Harvested wood products										
H. Other										
5. Waste	0.37	0.37	0.38	0.39	0.39	0.40	0.40	0.40	0.41	0.41
A. Solid waste disposal										

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
B. Biological treatment of solid waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
C. Incineration and open burning of waste	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Waste water treatment and discharge	0.37	0.37	0.38	0.38	0.39	0.39	0.39	0.40	0.40	0.40
E. Other										
6. Other *(as specified in summary 1.A)*										
Total CH_4 emissions without CH_4 from LULUCF	24.00	25.11	25.95	26.79	27.08	27.35	27.06	25.94	25.96	25.72
Total CH_4 emissions with CH_4 from LULUCF	24.68	25.77	26.60	27.41	27.68	27.93	27.63	26.51	26.48	26.24
Memo items:										
International bunkers	0.07	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.10	0.09
Aviation	0.05	0.05	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Navigation	0.02	0.03	0.03	0.03	0.02	0.03	0.03	0.03	0.03	0.03
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass										
CO_2 captured										
Long-term storage of C in waste disposal sites										
Indirect N_2O	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO
Indirect CO_2[(3)]										

CTF Table 1: Emission trends (N_2O – Part 3 of 3)

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
1. Energy	0.93	0.91	0.91	0.88	0.86	0.84	29.13
A. Fuel combustion (sectoral approach)	0.93	0.91	0.91	0.88	0.86	0.84	29.06
1. Energy industries	0.03	0.03	0.05	0.03	0.03	0.02	44.03
2. Manufacturing industries and construction	0.23	0.23	0.23	0.23	0.23	0.23	45.33
3. Transport	0.57	0.55	0.52	0.51	0.49	0.47	27.28
4. Other sectors	0.09	0.10	0.10	0.10	0.11	0.10	6.70
5. Other							
B. Fugitive emissions from fuels	0.00	0.00	0.00	0.00	0.00	0.00	258.03
1. Solid fuels	NO, NA	NO, NA	NO, NA	NO, NA	NA, NO	NA, NO	0.00
2. Oil and natural gas and other emissions from energy production	0.00	0.00	0.00	0.00	0.00	0.00	258.03
C. CO_2 transport and storage							
2. Industrial processes	0.18	0.18	0.19	0.20	0.20	0.20	–41.33
A. Mineral industry							
B. Chemical industry	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
C. Metal industry							
D. Non-energy products from fuels and solvent use	NA	NA	NA	NA	NA	NA	0.00
E. Electronic industry							
F. Product uses as ODS substitutes							
G. Other product manufacture and use	0.18	0.18	0.19	0.20	0.20	0.20	–41.33
H. Other							

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
3. Agriculture	24.60	25.43	26.06	26.16	26.70	26.89	51.19
A. Enteric fermentation							
B. Manure management	0.28	0.29	0.30	0.30	0.31	0.31	70.46
C. Rice cultivation							
D. Agricultural soils	24.30	25.13	25.74	25.84	26.38	26.57	51.06
E. Prescribed burning of savannas	IE	IE	IE	IE	IE	IE	0.00
F. Field burning of agricultural residues	0.02	0.01	0.02	0.02	0.02	0.01	–20.64
G. Liming							
H. Urea application							
I. Other carbon-containing fertilizers							
J. Other							
4. Land use, land-use change and forestry(2)	0.51	0.49	0.47	0.44	0.38	0.34	–42.40
A. Forest land	0.39	0.39	0.37	0.34	0.29	0.26	–38.29
B. Cropland	0.05	0.04	0.04	0.04	0.04	0.04	44.27
C. Grassland	0.06	0.05	0.05	0.05	0.05	0.04	–73.21
D. Wetlands	0.00	0.00	0.00	0.00	0.00	0.00	1,439.75
E. Settlements	0.00	0.00	0.00	0.00	0.00	0.00	1,100.00
F. Other land	0.01	0.01	0.01	0.01	0.01	0.01	4,685.91
G. Harvested wood products							
H. Other							
5. Waste	0.41	0.41	0.42	0.42	0.43	0.44	32.60
A. Solid waste disposal							
B. Biological treatment of solid waste	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	0.00

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
C. Incineration and open burning of waste	0.00	0.00	0.00	0.00	0.00	0.00	–21.77
D. Waste water treatment and discharge	0.41	0.41	0.41	0.42	0.43	0.43	33.48
E. Other							
6. Other *(as specified in summary 1.A)*							
Total CH_4 emissions without CH_4 from LULUCF	26.12	26.94	27.57	27.66	28.19	28.36	48.46
Total CH_4 emissions with CH_4 from LULUCF	26.62	27.43	28.04	28.10	28.57	28.70	45.72
Memo items:							
International bunkers	0.09	0.10	0.10	0.10	0.10	0.11	40.89
Aviation	0.06	0.07	0.07	0.07	0.07	0.08	107.46
Navigation	0.03	0.03	0.03	0.03	0.03	0.03	–23.06
Multilateral operations	NO	NO	NO	NO	NO	NO	0.00
CO_2 emissions from biomass							
CO_2 captured							
Long-term storage of C in waste disposal sites							
Indirect N_2O	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	NO, NE, IE	NO, NE, IE	0.00
Indirect CO_2[(3)]							

CTF Table 1: Emission trends (HFCs, PFCs, SF_6 and NF_3 – Part 1 of 3)

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
Emissions of HFCs and PFCs – (kt CO_2-equivalent)	909.95	903.79	461.92	210.33	204.73	207.61	390.50	353.78	273.67	321.48
Emissions of HFCs – (kt CO_2-equivalent)	NO, NA	NO, NA	0.04	0.17	18.55	57.87	129.18	132.74	156.35	252.81
HFC-23	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
HFC-32	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.00	0.01
HFC-41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-43-10mee	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-125	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.01	0.01	0.01
HFC-134	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-134a	NO, NA	NO, NA	0.00	0.00	0.01	0.03	0.08	0.06	0.08	0.13
HFC-143	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-143a	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.00	0.00	0.01
HFC-152	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-152a	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.00	0.00	0.00
HFC-161	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-227ea	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.00	0.00	0.00
HFC-236cb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-236ea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-236fa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-245ca	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-245fa	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
HFC-365mfc	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
Unspecified mix of HFCs[4] – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Emissions of PFCs – (kt CO_2-equivalent)	909.95	903.79	461.88	210.16	186.18	149.75	261.32	221.04	117.32	68.67
CF_4	0.11	0.10	0.05	0.02	0.02	0.02	0.03	0.02	0.01	0.01
C_2F_6	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_3F_8	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.00	NO, NA
C_4F_{10}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
c-C_4F_8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C_5F_{12}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C_6F_{14}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
$C_{10}F_{18}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
c-C_3F_6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unspecified mix of PFCs[4] – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unspecified mix of HFCs and PFCs – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Emissions of SF_6 – (kt CO_2-equivalent)	19.97	20.86	21.91	22.69	23.43	24.42	24.65	25.58	24.86	24.56
SF_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions of NF_3 – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NF_3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

CTF Table 1: Emission trends (HFCs, PFCs, SF_6 and NF_3 – Part 2 of 3)

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
Emissions of HFCs and PFCs – (kt CO_2-equivalent)	313.81	372.15	557.15	766.54	776.54	807.63	932.79	1,013.54	1,084.22	1,145.34
Emissions of HFCs – (kt CO_2-equivalent)	246.20	301.54	477.50	642.84	673.78	738.25	831.16	960.75	1,039.53	1,090.82
HFC-23	NO, NA	NO, NA	0.00	0.00	NO, NA	NO, NA	0.00	NO, NA	NO, NA	NO, NA
HFC-32	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.01	0.02
HFC-41	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-43-10mee	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-125	0.01	0.01	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09
HFC-134	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-134a	0.12	0.13	0.16	0.18	0.20	0.19	0.23	0.25	0.27	0.28
HFC-143	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-143a	0.01	0.01	0.03	0.05	0.05	0.06	0.06	0.07	0.08	0.08
HFC-152	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-152a	NO, NA	0.00	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA
HFC-161	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-227ea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-236cb	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-236ea	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-236fa	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-245ca	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HFC-245fa	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.00	0.00	0.00
HFC-365mfc	NO, NA	NO, NA	NO, NA	NO, NA	0.00	0.00	0.00	0.00	0.00	0.00

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
Unspecified mix of HFCs[4] – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Emissions of PFCs – (kt CO_2-equivalent)	67.61	70.61	79.65	123.70	102.76	69.38	101.63	52.79	44.69	54.52
CF_4	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
C_2F_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C_3F_8	NO, NA	NO, NA	0.00	0.00	0.00	NO, NA	0.00	0.00	0.00	0.00
C_4F_{10}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
c-C_4F_8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C_5F_{12}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C_6F_{14}	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
$C_{10}F_{18}$	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
c-C_3F_6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unspecified mix of PFCs[4] – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unspecified mix of HFCs and PFCs – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Emissions of SF_6 – (kt CO_2-equivalent)	20.34	20.82	24.11	26.40	29.72	25.96	21.89	20.74	20.23	23.48
SF_6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions of NF_3 – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NF_3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

CTF Table 1: Emission trends (HFCs, PFCs, SF_6 and NF_3 – Part 3 of 3)

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
Emissions of HFCs and PFCs – (kt CO_2-equivalent)	1,206.23	1,406.12	1,409.76	1,439.74	1,463.78	1,582.09	73.87
Emissions of HFCs – (kt CO_2-equivalent)	1,158.82	1,370.97	1,362.30	1,391.62	1,390.37	1,523.50	100.00
HFC-23	0.00	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
HFC-32	0.02	0.04	0.03	0.04	0.03	0.04	100.00
HFC-41	NA	NA	NA	NA	NA	NA	0.00
HFC-43-10mee	NA	NA	NA	NA	NA	NA	0.00
HFC-125	0.10	0.12	0.12	0.12	0.12	0.13	100.00
HFC-134	NA	NA	NA	NA	NA	NA	0.00
HFC-134a	0.29	0.36	0.36	0.38	0.37	0.41	100.00
HFC-143	NA	NA	NA	NA	NA	NA	0.00
HFC-143a	0.09	0.09	0.09	0.09	0.09	0.10	100.00
HFC-152	NA	NA	NA	NA	NA	NA	0.00
HFC-152a	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	0.00
HFC-161	NA	NA	NA	NA	NA	NA	0.00
HFC-227ea	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HFC-236cb	NA	NA	NA	NA	NA	NA	0.00
HFC-236ea	NA	NA	NA	NA	NA	NA	0.00
HFC-236fa	NA	NA	NA	NA	NA	NA	0.00
HFC-245ca	NA	NA	NA	NA	NA	NA	0.00
HFC-245fa	0.00	0.00	0.00	0.00	0.00	0.00	100.00
HFC-365mfc	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Unspecified mix of HFCs[4] – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	0.00

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
Emissions of PFCs – (kt CO_2-equivalent)	47.41	35.15	47.46	48.13	73.41	58.59	–93.56
CF_4	0.01	0.00	0.01	0.01	0.01	0.01	–93.75
C_2F_6	0.00	0.00	0.00	0.00	0.00	0.00	–92.46
C_3F_8	NO, NA	0.00	0.00	0.00	0.00	0.00	100.00
C_4F_{10}	NA	NA	NA	NA	NA	NA	0.00
c-C_4F_8	NA	NA	NA	NA	NA	NA	0.00
C_5F_{12}	NA	NA	NA	NA	NA	NA	0.00
C_6F_{14}	NA	NA	NA	NA	NA	NA	0.00
$C_{10}F_{18}$	NA	NA	NA	NA	NA	NA	0.00
c-C_3F_6	NA	NA	NA	NA	NA	NA	0.00
Unspecified mix of PFCs[4] – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	0.00
Unspecified mix of HFCs and PFCs – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	0.00
Emissions of SF_6 – (kt CO_2-equivalent)	23.85	19.97	22.38	19.92	18.13	17.85	–10.61
SF_6	0.00	0.00	0.00	0.00	0.00	0.00	–10.61
Emissions of NF_3 – (kt CO_2-equivalent)	NA	NA	NA	NA	NA	NA	0.00
NF_3	NA	NA	NA	NA	NA	NA	0.00

CTF Table 1: Emissions trends summary (Part 1 of 3)

Greenhouse gas source and sink categories	Base year (1990) (kt CO_2-equivalent)	1991 (kt CO_2-equivalent)	1992 (kt CO_2-equivalent)	1993 (kt CO_2-equivalent)	1994 (kt CO_2-equivalent)	1995 (kt CO_2-equivalent)	1996 (kt CO_2-equivalent)	1997 (kt CO_2-equivalent)	1998 (kt CO_2-equivalent)	1999 (kt CO_2-equivalent)
CO_2 emissions without net CO_2 from LULUCF	25,428.64	26,116.59	28,107.90	27,705.40	27,887.47	28,151.65	29,374.88	31,355.60	29,934.03	31,528.93
CO_2 emissions with net CO_2 from LULUCF	–4,964.09	–6,268.47	–3,778.59	–4,845.38	–4,727.06	–3,008.72	–1,371.03	–395.09	–2,251.82	–2,230.43
CH_4 emissions without CH_4 from LULUCF	32,522.20	32,734.98	32,433.48	32,469.35	33,182.56	33,597.24	34,209.58	34,835.42	34,130.15	34,437.13
CH_4 emissions with CH_4 from LULUCF	32,615.40	32,814.52	32,522.36	32,573.08	33,286.78	33,708.98	34,332.60	34,946.24	34,267.34	34,528.74
N_2O emissions without N_2O from LULUCF	5,693.06	5,782.31	5,844.30	6,036.37	6,224.70	6,466.83	6,592.70	6,751.82	6,657.63	6,737.22
N_2O emissions with N_2O from LULUCF	5,870.20	5,957.41	6,022.20	6,220.59	6,417.82	6,663.65	6,796.75	6,957.38	6,865.47	6,938.93
HFCs	NO, NA	NO, NA	0.04	0.17	18.55	57.87	129.18	132.74	156.35	252.81
PFCs	909.95	903.79	461.88	210.16	186.18	149.75	261.32	221.04	117.32	68.67
Unspecified mix of HFCs and PFCs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF_6	19.97	20.86	21.91	22.69	23.43	24.42	24.65	25.58	24.86	24.56
NF_3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (without LULUCF)	64,573.82	65,558.53	66,869.50	66,444.14	67,522.89	68,447.75	70,592.31	73,322.21	71,020.33	73,049.33
Total (with LULUCF)	34,451.43	33,428.11	35,249.79	34,181.32	35,205.70	37,595.94	40,173.47	41,887.90	39,179.52	39,583.29
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1. Energy	23,748.50	24,139.60	26,041.18	25,475.07	25,761.91	25,869.80	27,360.01	29,298.53	27,761.83	29,193.18
2. Industrial processes and product use	3,584.36	3,733.12	3,378.42	3,217.91	3,098.38	3,209.34	3,427.85	3,297.90	3,267.12	3,478.87
3. Agriculture	33,122.91	33,470.95	33,148.65	33,363.55	34,340.01	34,983.73	35,357.75	36,232.68	35,472.84	35,822.43
4. Land use, land-use change and forestry(5)	–30,122.39	–32,130.42	–31,619.71	–32,262.82	–32,317.20	–30,851.81	–30,418.84	–31,434.31	–31,840.82	–33,466.05
5. Waste	4,118.05	4,214.87	4,301.26	4,387.61	4,322.58	4,384.88	4,446.70	4,493.09	4,518.55	4,554.86
6. Other										
Total (including LULUCF)(5)	34,451.43	33,428.11	35,249.79	34,181.32	35,205.70	37,595.94	40,173.47	41,887.90	39,179.52	39,583.29

CTF Table 1: Emissions trends summary (Part 2 of 3)

Greenhouse gas source and sink categories	2000 (kt CO_2-equivalent)	2001 (kt CO_2-equivalent)	2002 (kt CO_2-equivalent)	2003 (kt CO_2-equivalent)	2004 (kt CO_2-equivalent)	2005 (kt CO_2-equivalent)	2006 (kt CO_2-equivalent)	2007 (kt CO_2-equivalent)	2008 (kt CO_2-equivalent)	2009 (kt CO_2-equivalent)
CO_2 emissions without net CO_2 from LULUCF	32,358.64	34,587.07	34,768.50	36,495.10	36,060.32	37,642.41	37,515.69	36,645.12	37,666.27	34,791.66
CO_2 emissions with net CO_2 from LULUCF	–297.12	2,554.22	5,150.35	5,756.31	5,333.00	8,512.04	10,027.34	11,254.84	3,768.23	4,233.72
CH_4 emissions without CH_4 from LULUCF	35,297.09	35,492.76	35,436.59	35,659.08	35,593.17	35,868.57	3,6017.47	3,4759.87	33,698.96	34,083.69
CH_4 emissions with CH_4 from LULUCF	35,383.83	35,578.86	35,521.67	35,751.35	35,682.60	36,006.97	36,165.62	34,955.85	33,786.05	34,195.44
N_2O emissions without N_2O from LULUCF	7,152.93	7,482.43	7,733.26	7,982.79	8,070.39	8,149.12	8,063.09	7,729.55	7,735.11	7,665.89
N_2O emissions with N_2O from LULUCF	7,353.59	7,679.83	7,925.42	8,169.49	8,248.64	8,324.17	8,233.39	7,901.26	7,892.51	7,818.87
HFCs	246.20	301.54	477.50	642.84	673.78	738.25	831.16	960.75	1,039.53	1,090.82
PFCs	67.61	70.61	79.65	123.70	102.76	69.38	101.63	52.79	44.69	54.52
Unspecified mix of HFCs and PFCs	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SF_6	20.34	20.82	24.11	26.40	29.72	25.96	21.89	20.74	20.23	23.48
NF_3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (without LULUCF)	75,142.80	77,955.23	78,519.60	80,929.90	80,530.14	82,493.69	82,550.94	80,168.82	80,204.79	77,710.07
Total (with LULUCF)	42,774.45	46,205.88	49,178.70	50,470.09	50,070.49	53,676.77	55,381.04	55,146.23	46,551.24	47,416.85
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1. Energy	30,001.99	32,077.51	32,100.95	33,590.91	33,126.33	34,573.81	34,740.10	33,453.64	34,858.78	32,116.59
2. Industrial processes and product use	3,462.02	3,566.33	3,758.25	4,059.64	4,054.91	4,112.67	4,205.67	4,486.56	4,355.01	4,297.28
3. Agriculture	37,067.47	37,647.73	37,954.36	38,623.31	38,676.52	39,114.55	38,989.67	37,631.20	36,460.77	36,815.92
4. Land use, land-use change and forestry[5]	–32,368.35	–31,749.35	–29,340.90	–30,459.81	–30,459.65	–28,816.92	–27,169.90	–25,022.59	–33,653.55	–30,293.22
5. Waste	4,611.31	4,663.67	4,706.04	4,656.04	4,672.38	4,692.65	4,615.49	4,597.43	4,530.23	4,480.27
6. Other										
Total (including LULUCF)[5]	42,774.45	46,205.88	49,178.70	50,470.09	50,070.49	53,676.77	55,381.04	55,146.23	46,551.24	47,416.85

CTF Table 1: Emissions trends summary (Part 3 of 3)

Greenhouse gas source and sink categories	2010 (kt CO_2-equivalent)	2011 (kt CO_2-equivalent)	2012 (kt CO_2-equivalent)	2013 (kt CO_2-equivalent)	2014 (kt CO_2-equivalent)	2015 (kt CO_2-equivalent)	Change from base to latest reported year (%)
CO_2 emissions without net CO_2 from LULUCF	35,017.74	34,332.22	35,654.67	35,086.94	35,584.98	35,911.43	41.22
CO_2 emissions with net CO_2 from LULUCF	4,142.31	7,946.72	9,945.64	10,724.05	11,594.78	11,947.43	–340.68
CH_4 emissions without CH_4 from LULUCF	34,046.81	34,165.81	34,626.37	34,608.32	34,800.29	34,191.91	5.13
CH_4 emissions with CH_4 from LULUCF	34,157.05	34,245.24	34,710.96	34,686.03	34,880.10	34,271.26	5.08
N_2O emissions without N_2O from LULUCF	7,782.56	8,027.00	8,216.36	8,242.24	8,400.69	8,451.85	48.46
N_2O emissions with N_2O from LULUCF	7,933.54	8,174.40	8,357.31	8,372.43	8,515.12	8,553.88	45.72
HFCs	1,158.82	1,370.97	1,362.30	1,391.62	1,390.37	1,523.50	100.00
PFCs	47.41	35.15	47.46	48.13	73.41	58.59	–93.56
Unspecified mix of HFCs and PFCs	NA	NA	NA	NA	NA	NA	0.00
SF_6	23.85	19.97	22.38	19.92	18.13	17.85	–10.61
NF_3	NA	NA	NA	NA	NA	NA	0.00
Total (without LULUCF)	78,077.20	77,951.12	79,929.55	79,397.17	80,267.87	80,155.14	24.13
Total (with LULUCF)	47,462.99	51,792.44	54,446.07	55,242.18	56,471.91	56,372.51	63.63
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	0.00
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	0.00
1. Energy	32,184.55	31,272.51	32,466.20	31,906.16	32,269.10	32,455.18	36.66
2. Industrial processes and product use	4,655.46	4,826.41	4,811.47	4,925.18	5,067.03	5,279.68	47.30
3. Agriculture	36,861.67	37,590.15	38,460.38	38,450.41	38,847.04	38,419.63	15.99
4. Land use, land-use change and forestry[5]	–30,614.21	–26,158.68	–25,483.48	–24,154.99	–23,795.96	–23,782.63	–21.05
5. Waste	4,375.52	4,262.05	4,191.51	4,115.43	4,084.71	4,000.66	–2.85
6. Other							
Total (including LULUCF)[5]	47,462.99	51,792.44	54,446.07	55,242.18	56,471.91	56,372.51	63.63

Note: C = carbon; CH_4 =methane; CO_2 = carbon dioxide; HFCs = hydrofluorocarbons; IE = included elsewhere; kt CO_2-equivalent = kilotonnes carbon dioxide equivalent; LULUCF = land use, land-use change and forestry; N_2O = nitrous oxide; NA = not applicable; NE = not estimated; NF_3 = nitrogen trifluoride; NO = not occurring; ODS = ozone depleting substances; PFCs = perfluorocarbons; SF_6 = sulphur hexafluoride.

(1) The column 'Base year' should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the COP. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

(2) Fill in net emissions/removals as reported in table Summary 1.A. For the purposes of reporting, the signs for removals are always negative (–) and for emissions positive (+).

(3) In accordance with the UNFCCC reporting guidelines, for Parties that decide to report indirect CO_2 the national totals shall be provided with and without indirect CO_2.

(4) In accordance with the UNFCCC reporting guidelines, HFC and PFC emissions should be reported for each relevant chemical. However, if it is not possible to report values for each chemical (ie, mixtures, confidential data, lack of disaggregation), this row could be used for reporting aggregate figures for HFCs and PFCs, respectively. Note that the unit used for this row is kt of CO_2 equivalent and that appropriate notation keys should be entered in the cells for the individual chemicals.

(5) Includes net CO_2, CH_4 and N_2O from LULUCF.