



What are these reports?

The national communication report is a detailed description of how New Zealand is meeting its international commitments on climate change. It is published every four years. *New Zealand's Seventh National Communication* covers the years 2013-2017.

It discusses:

- > the circumstances relevant to our emissions profile
- > New Zealand's past and projected greenhouse emissions
- > New Zealand's action on climate change, at home and overseas
- > what the future may look like under a changing climate.

The biennial report contains a subset of the information in the national communication. It describes New Zealand's progress towards achieving our emissions reduction targets and how New Zealand supports developing countries in their climate change work. The biennial report is updated every two years.

The Ministry for the Environment produces the biennial report and the national communication as part of New Zealand's obligations under the United Nations Framework Convention on Climate Change (UNFCCC).¹

The Ministry for the Environment leads the production of the reports, but compiling them is a cross-governmental effort. This snapshot provides an overview of the reports.

The full versions of these reports are available on the Ministry for the Environment's website:
<http://www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-national-communication-and-biennial-report>.

¹ New Zealand also publishes an annual Greenhouse Gas Inventory under the UNFCCC reporting obligations (<http://www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-greenhouse-gas-inventory>).

Key points

- > New Zealand's national circumstances mean that our emissions profile is dominated by the agriculture and energy sectors, which together form around 88 per cent of the gross greenhouse emissions.
- > Based on current data and policies, New Zealand's gross emissions are projected to gradually decrease to 77.2 Mt CO₂-e by 2030. This is 19.6 per cent above 1990 levels and 6.4 per cent below 2005 levels.
- > New Zealand is committed to being a leader in action on climate change.
- > New Zealand ratified the Paris Agreement in 2016, and announced the target to reduce greenhouse gas emissions to 30 per cent below 2005 levels by 2030.
- > Our latest net position shows we are on track to meet our current 2020 emissions reduction target, with a surplus of 97.7 million units.
- > New Zealand supports climate change action in developing countries. New Zealand contributed approximately NZ\$455 million in climate-related support for developing countries during 2013-2016.
- > This National Communication for the first time includes reporting on Tokelau's response to the challenges of climate change. Tokelau has produced a climate change strategy which is annexed in the *Seventh National Communication*.
- > Looking ahead:
 - New Zealand is working on transitioning to a low-carbon and climate-resilient economy.
 - Work is underway to look at establishing a Zero Carbon Act and an independent Climate Commission.
 - A Climate Change Adaptation Technical Working Group was set up in 2016 to provide advice on options for how New Zealand can adapt to the effects of climate change.

Past and projected greenhouse gas emissions

New Zealand's national circumstances affect our emissions profile

Gross greenhouse gas emissions are those from the agriculture, energy, industrial processes and product use (IPPU), and waste sectors (figure 1). In 2015, our gross emissions were 80.2 million tonnes of carbon dioxide equivalent (Mt CO₂-e)². New Zealand's gross emissions have increased by 24.1 per cent from the 1990 levels on the back of strong population growth and an increase in domestic production (figure 2).

Net emissions under the UNFCCC rules consist of gross emissions combined with emissions and removals from the Land Use, Land-Use Change and Forestry (LULUCF) sector. Forests help address climate change by removing carbon dioxide from the atmosphere as they grow. Forests also emit carbon dioxide after being harvested, deforested, or following natural disturbance, such as storm damage. New Zealand's net emissions under the UNFCCC were 56.4 Mt CO₂-e in 2015.

Our emissions profile is dominated by the agriculture and energy sectors, which together comprise approximately 88 per cent of gross greenhouse gas emissions (figure 1). New Zealand is an outlier amongst developed countries because emissions from agriculture comprise of almost half of gross emissions (47.9 per cent) while energy emissions make up 40.5 per cent. More than three-quarters of

New Zealand's electricity generation uses renewable resources – primarily hydro generation which has helped keep energy generation emissions low.

The agriculture sector is very important to New Zealand. Our export-dependent economy relies on the agriculture industry, and around 85 per cent of New Zealand's total food production goes to the international market.

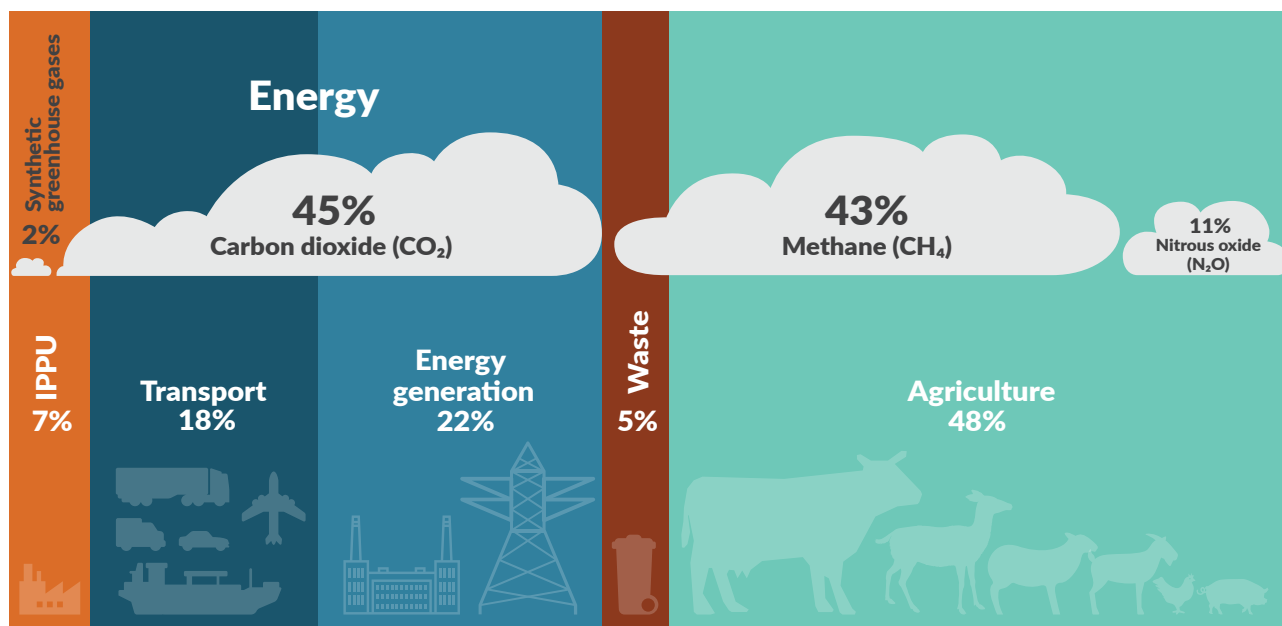
Roads are the main form of transport in New Zealand due to the widely distributed population of 4.8 million people, and mountainous terrain. This has contributed to a dependence on fossil fuel-powered road transport.

New Zealand's emissions increased between 1990 and 2005 (figure 2). This increase was mainly driven by:

- > carbon dioxide emissions from chemical industry and food processing
- > methane emissions from livestock digestive systems
- > nitrous oxide emissions from fertiliser used on agricultural soils
- > fluorinated gases released from industrial, and household refrigeration and air-conditioning systems.

Gross emissions have stabilised since 2005, and decoupled from economic growth (meaning our economy is growing faster than emissions). But New Zealand faces challenges in terms of finding low cost opportunities to further reduce its emissions.

Figure 1: New Zealand's emissions profile in 2015.

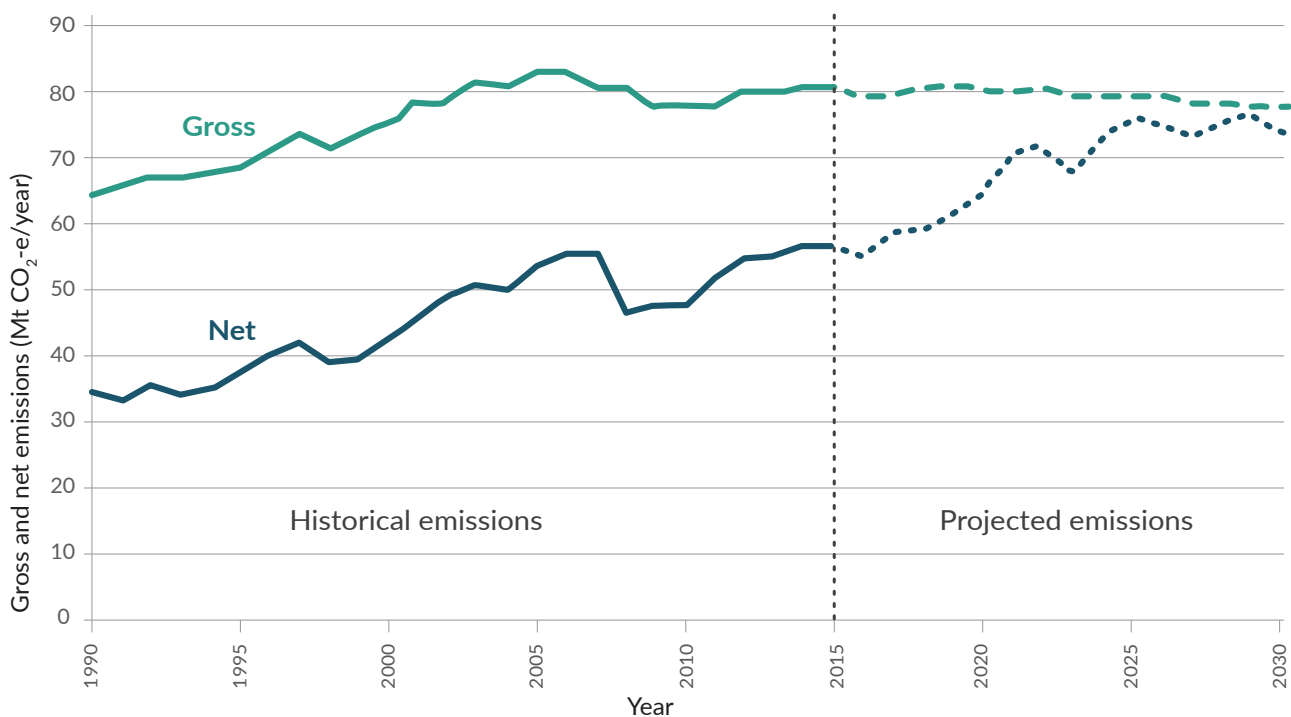


Source: New Zealand Greenhouse Gas Inventory 1990-2015, Ministry for the Environment.

Notes: – Percentage may not add up to 100%, as they are rounded to the nearest percent.
– Energy sector consists of transport and energy generation.

² Carbon dioxide equivalent (CO₂-e) is a measure for describing how much global warming a given type and amount of greenhouse gas may cause, using the equivalent amount of carbon dioxide as the reference. It allows the different greenhouse gases to be reported consistently.

Figure 2: New Zealand's historical (solid lines) and projected (dashed-lines) gross emissions (green lines) and net emissions (blue lines). The projected emissions are based on our current data and policies.



Projections show we need to do more to meet our targets

Projections of New Zealand's greenhouse gas emissions are useful in demonstrating the impact of policies, long-term trends in emissions, and progress towards emissions reduction targets.

Based on current data and policies, New Zealand's gross emissions are projected to gradually decrease to 77.2 Mt CO₂-e by 2030 (figure 2). This is 19.6 per cent above 1990 levels and 6.4 per cent below 2005 levels.

This decreasing trend in gross emissions to 2030 is due to:

- > a greater amount of land-use change from agriculture to forestry
- > more sustainable farm management practices
- > reduced energy use, combined with less carbon-intensive fuels used for energy production.

New Zealand's net emissions are projected to increase to 73.2 Mt CO₂-e by 2030 (figure 2). Forest harvest rates have been increasing since 1990 and this trend is expected to continue through the 2020s. It will mean our net emissions will increase as harvest rates are one of the main drivers of net emissions.

This increase in emissions from more harvesting is compounded by recent low rates of new forest planting. This combined with increased deforestation since mid-2000s means there are less younger-aged forests growing to offset emissions. The trend will reverse in the mid-2030s as harvest rates are projected to decline.

While these estimates are based on the best data available, projections are inherently uncertain. Economic variables, such as oil price and the assumed carbon price, have significant effects on projected emissions and removals. In addition, seasonal changes, especially variation in rainfall, can affect agriculture and electricity generation emissions.

New Zealand's emissions reductions targets

Global momentum from the Paris Agreement continues to shape the climate change policies within Government and the business sector. New Zealand has ratified the Paris Agreement and committed to its Nationally Determined Contribution (NDC).³

The Paris Agreement (our 2030 target)

The goal of the historic Paris Agreement is to limit the global temperature increase to 1.5-2°C above pre-industrial levels in this century.

New Zealand ratified the Paris Agreement on 4 October 2016. Ratification is a formal step that countries must take to become full participants and to ensure the deal takes effect. The Paris Agreement came into force on 4 November 2016 and will take effect from 2020. Our target (the NDC) covers the period of 2021-2030.

New Zealand's NDC is to reduce greenhouse gas emissions by 30 per cent below our 2005 levels by 2030. This is equivalent to 11 per cent below 1990 levels.

The New Zealand public was consulted before setting the 2030 target. The consultation process in 2015 included 15 public meetings and hui⁴ across New Zealand, and we received 17,023 written submissions.

The NDC under the Paris Agreement is the fourth national target the Government has set for reducing New Zealand's greenhouse gas emissions. The other three are our past (2012), current (2020), and long-term (2050) targets.

- > **Our past target** under the first Kyoto Protocol⁵ commitment period (CP1) was to reduce greenhouse gas emissions to 1990 levels between 2008 and 2012. New Zealand was confirmed to have met this target in 2016, when its 'True-up Report' was reviewed by the UNFCCC.⁶
- > **New Zealand's current target** is to reach 5 per cent below our 1990 greenhouse gas emissions levels by 2020. This is an unconditional target under the rules of the UNFCCC. Although New Zealand chose to take its 2020 target under the UNFCCC rather than the Kyoto Protocol, we are applying the Kyoto Protocol rules in our emissions accounting. The Ministry for the Environment reports progress towards the 2020 target in the net position report (figure 3). New Zealand is on track to meet this target.
- > **Our long-term target** is to reach 50 per cent below our 1990 greenhouse gas emissions levels by 2050.

New Zealand uses a multi-year carbon budget approach for setting and measuring progress towards our targets. A carbon budget is the quantity of emissions we are allowed to emit if we are to reduce our emissions to meet a target. This means that progress is not measured by looking at emissions in a single year, but includes a comparison of emissions in all years of each target period (2008-2012, 2013-2020 and 2021-2030). This approach was required by countries that took a first commitment period target under the Kyoto Protocol, and is being used by New Zealand for the 2020 and 2030 targets as well.

New Zealand will meet its future targets through a mix of reducing emissions domestically, planting forests to absorb carbon dioxide, and offsetting our emissions by buying emissions reductions from overseas. For meeting the 2020 target, New Zealand can also count the surplus of 123.7 million emission units⁷ from the first commitment period of the Kyoto Protocol (2008-2012).

Tracking emissions against our current target – New Zealand's 2020 net position report

Progress towards the 2020 target is published in New Zealand's net position report.⁸

The latest 2020 net position report shows New Zealand is projected to meet its target of reducing emissions to 5 per cent below 1990 levels, with a surplus of 97.7 million units (figure 3).

A country must hold units that are at least equivalent to its gross emissions from 2013-2020 at the end of the period.

The 2020 net position in figure 3 shows that:

- > New Zealand's gross emissions from 2013 to 2020 are projected to be 638.7 Mt CO₂-e
- > New Zealand will hold 736.4 million units at the end of the period. This consists of:
 - a carbon budget of 509.8 million units
 - carbon dioxide removals from forestry and land-use activities included in the Kyoto Protocol corresponding to 102.9 million units
 - a surplus of 123.7 million units from the first commitment period (2008-2012).

3 Ahead of the climate change negotiations in Paris, all countries were asked to put forward a target to reduce emissions in the period after 2020. These were known as Intended Nationally Determined Contributions or INDCs. Once ratified, the INDC is known as a Nationally Determined Contribution (NDC)

4 A hui refers to a gathering or meeting. It can involve individuals, a hapū (a grouping of related families) or several hapū, an entire iwi (a larger Māori grouping, sometimes called a tribe), or several iwi.

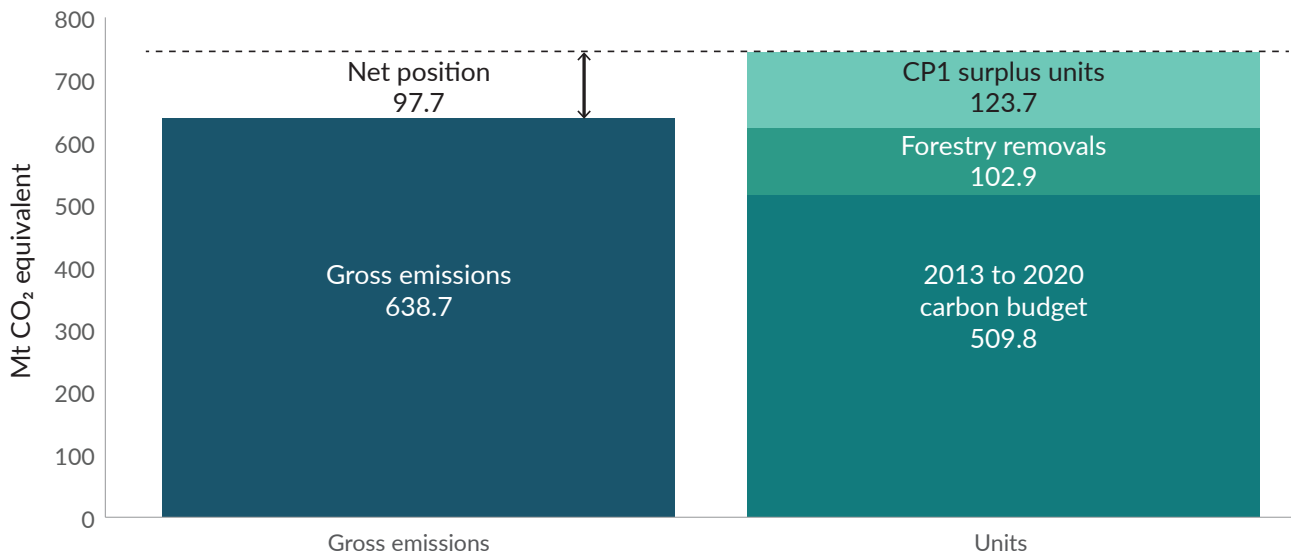
5 The Kyoto Protocol entered into force on 16 February 2005. It is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties to setting internationally binding emission reduction targets.

6 'True-up report' is a technical report that provides the basis for the official UNFCCC assessment of each country's compliance with its emissions reduction commitments. The report is reviewed by an independent expert team.

7 One emission unit is the amount of greenhouse gases that is equivalent to 1 tonne of CO₂-e.

8 The report is available at <http://www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/latest-2020-net-position>

Figure 3: New Zealand's projected gross emissions and units over the 2013-2020 period.



New Zealand's action on climate change

New Zealand is working to transition to a low emissions economy while adapting to the impacts of climate change. Highlights of New Zealand's work on climate change, and the progress made in the reporting period, are summarised below.

New Zealand's Emissions Trading Scheme is our main tool for domestic emissions reductions

The New Zealand Emissions Trading Scheme (NZ ETS) requires emitters that are participants in the scheme to report on their emissions and surrender emissions units that correspond to their obligations. 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 is a long-term tool. The Government is committed to regularly reviewing the NZ ETS and making any modifications as needed to ensure New Zealand meets its international climate change obligations and reduces emissions.

Other strategies to reduce emissions include:

- > **Afforestation Grant Scheme:** The Government has provided new funding for 2015-2020 to encourage and support the planting of new forests.
- > **Electric Vehicles (EV) programme:** This programme introduces measures to increase the uptake of EVs – leveraging New Zealand's high proportion of renewable electricity. For example, an EV package announced in 2016 aims to double the number of EVs registered in New Zealand every year to reach 64,000 by 2021. New Zealand exceeded its 2016 EV target.
- > **New Zealand Energy Efficiency and Conservation Strategy (NZECS) 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 NZECS. One of the targets is to increase the proportion of electricity generated from renewable sources to 90 per cent by 2025.

Climate change research is an investment in the future

New Zealand funds research relating to emissions mitigation and adaptation in a range of subject areas. New Zealand's key focus is on researching ways to reduce emissions from agriculture production. This is an area where New Zealand continues to provide expertise internationally. Since the publication of *New Zealand's Sixth National Communication* in 2013, we have:

- > advanced research on greenhouse gas mitigation, such as research to identify methane inhibitors, develop low methane-emitting sheep through genetics, progress towards a methane vaccine, and identify naturally occurring compounds that can lower nitrous oxide emissions from pasture
- > established two reference groups:
 - Biological Emissions Reference Group aims to build robust evidence on what the sector can do on-farm to reduce emissions, and assess the costs and opportunities of doing so
 - Climate Change Forestry Reference Group explores options to inform and support policies that enable forestry to contribute to New Zealand's emissions reduction targets
- > contributed funding and expertise to international research activities of the Global Research Alliance on Agricultural Greenhouse Gases and continued to co-chair its Livestock Research Group.

New Zealand supports climate change action in developing countries

New Zealand helps developing countries to decrease emissions and to prepare for the impacts of climate change. This includes:

- > providing assistance in building stronger and more resilient infrastructure, strengthening disaster preparedness, and supporting low-carbon economic growth
- > helping to improve access to affordable, reliable and clean energy
- > supporting low emissions agricultural development through the Global Research Alliance on Agricultural Greenhouse Gases.

New Zealand contributed approximately NZ\$455 million in climate-related support for developing countries between the years 2013-2016, a NZ\$146 million increase from the previous reporting period.

Reporting on Tokelau's climate change response

Tokelau has been a dependent territory of New Zealand since 1926, and is considered "part of New Zealand" for certain purposes under the Tokelau Act 1948 (NZ). As part of extending New Zealand's ratification of the Paris Agreement to Tokelau, New Zealand included information on climate change in Tokelau in this National Communication report for the first time.

Tokelau's low-lying atolls are very vulnerable to the impacts of climate change. Tokelau has produced a strategy and an implementation plan as a response to the challenges posed by climate change and related hazards.⁹ New Zealand's Government is working closely with Tokelau's national legislative and executive body to help achieve its vision for the future under this strategy. New Zealand will also continue to work with Tokelau to meet reporting obligations under the UNFCCC and the Paris Agreement.

Together we can make a difference

We can all play a part in New Zealand's climate change action. Learning about climate change is the first step. The Government actively supports initiatives that encourage public awareness of climate change. Over the past four years, the Government has run a number of public awareness campaigns, including household and vehicle energy efficiency campaigns, tools for measuring emissions, and environmental awards. The Ministry for the Environment provides accurate and up-to-date information on climate change on its website.¹⁰

⁹ The strategy and the implementation plan are appended in *New Zealand's Seventh National Communication*.

¹⁰ <http://www.mfe.govt.nz/climate-change>

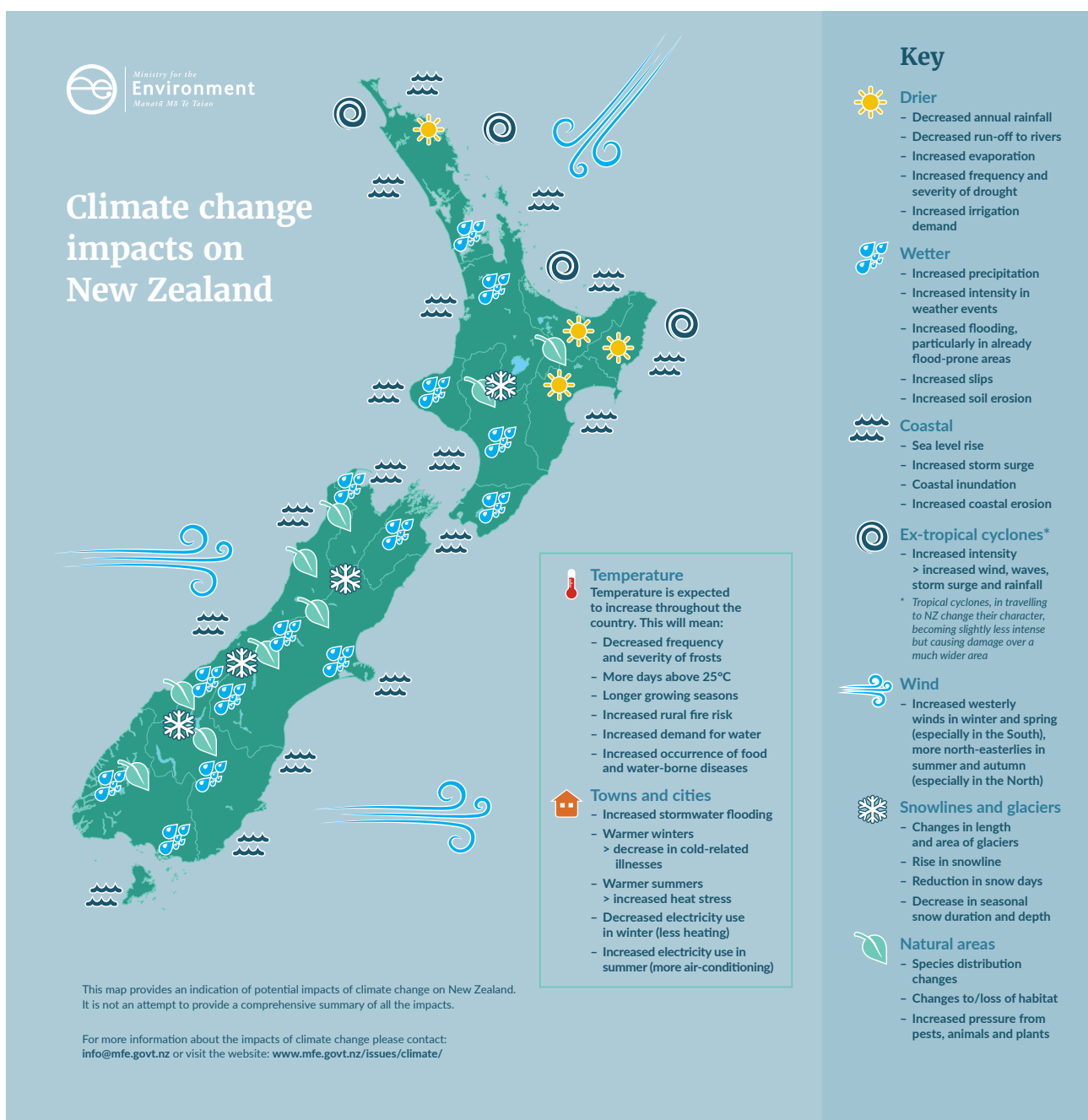
New Zealand's future in a changing climate

We cannot predict exactly what New Zealand's future under climate change will look like, but we know the approximate direction of changes (see map 1).

New Zealand will become warmer (particularly in the north and east), rainfall patterns will change around the country, and the climatic conditions will become more unpredictable. It is projected that there will be more frequent and intense floods and droughts, and at the coast, floods will interact with rising sea levels and increased storm surge heights.

There are factors that make New Zealand vulnerable to risks associated with extreme weather, sea-level rise and shifts in climatic conditions. We have approximately 17,200 kilometres of shoreline, and most of New Zealand's towns and cities are located by the sea. Our economy relies on the primary production sector, which is sensitive to the shifts in climatic conditions. These will be major challenges for New Zealand economically, socially and environmentally.

Map 1: This map provides an overview of some of the projected impacts of climate change in New Zealand.



Adaptation is required to create resilient communities

New Zealand continues to explore opportunities to reduce emissions. At the same time, New Zealand is prioritising work on how to adapt to the impacts of climate change so our country becomes more resilient to the changes.

Some of the developments in adaptation work in this reporting period are listed below.

- > A Climate Change Adaptation Technical Working Group was set up by the Minister for Climate Change Issues in 2016 to provide advice on options for how New Zealand can adapt to the effects of climate change. The Group is expected to deliver a final report on options in early 2018.
- > Updated climate projections for New Zealand were produced based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).¹¹
- > The Royal Society identified six key risks for New Zealand in their report *Climate Change Implications for New Zealand*. These are:
 - risks to our coastal margins
 - flooding from rivers
 - availability and competition for fresh water
 - changes to our surrounding oceans
 - threats to unique ecosystems
 - flow-on effects from climate change impacts and responses elsewhere.
- > The four-year Climate Change Impacts and Implications project was completed in 2016. This research is continuing as part of the Deep South National Science Challenge (Impacts and Implications programme).
- > The Resource Legislation Amendment Act 2017 introduced "The management of significant risks from natural hazards" as a new matter of national importance in section 6 of the Resource Management Act.
- > Chapter 6 (Vulnerability assessment, climate change impacts and adaptation measures) of the *Seventh National Communication* also serves as New Zealand's first adaptation communication under the Paris Agreement.

11 <http://www.mfe.govt.nz/climate-change/likely-impacts-of-climate-change>

12 According to one definition, "low-carbon economy for New Zealand is one that trends towards net zero emissions of carbon dioxide (CO₂), over the next few decades, while also reducing emissions of shorter lived gases, mainly methane (CH₄)." Source: Sims, R., Barton, B., Bennett, P., Isaacs, N., Kerr, S., Leaver, J., ... & Stephenson, J. (2016). *Transition to a low-carbon economy for New Zealand*.

13 The NRS agencies are: Ministry of Business, Innovation and Employment, Ministry for the Environment, Ministry for Primary Industries, Land Information New Zealand, Department of Conservation, Te Puni Kōkiri, Department of Internal Affairs, and Ministry of Transport

New Zealand is working towards a low-carbon economy

New Zealand is committed to being a leader in the global response to climate change, and transitioning to a low-carbon¹² and climate-resilient economy. Some examples of the ongoing work in this area are listed below.

The Productivity Commission is looking at how to transition to a low emissions economy

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 Productivity Commission published an issues paper to help individuals and organisations to participate in the inquiry. A final report to the Government is due by 30 June 2018.

The transition hub was established in 2017

A low emissions economy transition hub was established within Natural Resources Sector government agencies in 2017.¹³ This hub brings relevant government agencies together to work and partner with the private sector. The hub is designed to provide costed, tested and modelled policy options for meeting New Zealand's 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 for domestic emissions reductions that will contribute towards meeting New Zealand's emissions target.

Work is underway to look at establishing a Zero Carbon Act and an independent Climate Commission.

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



> Full reports are available on the Ministry for the Environment's website at: <http://www.mfe.govt.nz/climate-change/reporting-greenhouse-gas-emissions/nzs-national-communication-and-biennial-report>



New Zealand Government

Published in December 2017 by the Ministry for the Environment, Manatū Mō Te Taiao, PO Box 10362, Wellington 6143, New Zealand
Publication number: INFO 814