SEPTEMBER 2016

New Zealand's Action on Climate Change

Climate change is the biggest environmental challenge of our time. How we respond now will affect generations to come.

New Zealand Government

Why climate change matters

This is a short stocktake of New Zealand action on climate change in 2016. What we do today will shape and inform what we do next.

It's no exaggeration to say that climate change is the largest environmental challenge of our time. The effect humans are having on our planet will touch every aspect of our lives, from where we live to how we live and potentially even how long.

Sometimes I think it seems so big, and there's so much politics or technical information being thrown around that it scares people and they simply don't know what to think.

When it comes down to it, responding to climate change is about holding on to all that we love about this beautiful country of ours and preserving it for our children and grandchildren.

This snapshot is by no means exhaustive, but pulls together some of the impressive work going on across all parts of society. There's more to be done, and the Government is committed to keeping up the progress.

Hon Paula Bennett
Minister for Climate Change Issues

A changing climate will affect our economy, environment and way of life.

Globally, we are already seeing communities being threatened by sea level rise and storm surges. Climate change threatens biodiversity and food sources. In New Zealand, extreme weather events made worse by climate change cause costly damage, higher insurance premiums, loss of taonga, lowered productivity, and changes to our markets.

Rainfall patterns across New Zealand will change. This affects tourism, ski fields, hydro-electricity generation, irrigation, and ecosystems. In some places it will mean more rainfall and floods, or droughts. A changing climate will change disease patterns and pathology. This will affect human health, and livestock and crop productivity. Entire ecosystems are being affected by ocean acidification, which threatens our $2.5 billion fishing industry.

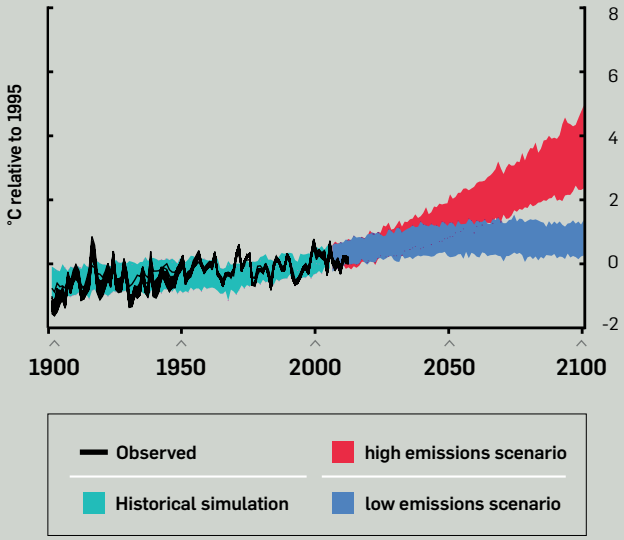
Projected average increase in NZ temperatures (compared to 1995)

	2040	2090
High global GHG emissions scenario	1°C	3°C
Low global GHG emissions scenario	0.7°C	0.7°C

Source: Ministry for the Environment

On the flip side, warmer temperatures, a longer growing season and fewer frosts could lead to faster pasture growth, better crop conditions, and opportunities for new crops. Our response to climate change can inspire innovation, generate new markets, lead to better air quality, clean energy, and the opportunity to build greener homes, businesses and cities. It requires us to plan well, adapt, and move together towards a low-emissions and climate-resilient economy.

New Zealand's future climate depends on global emissions



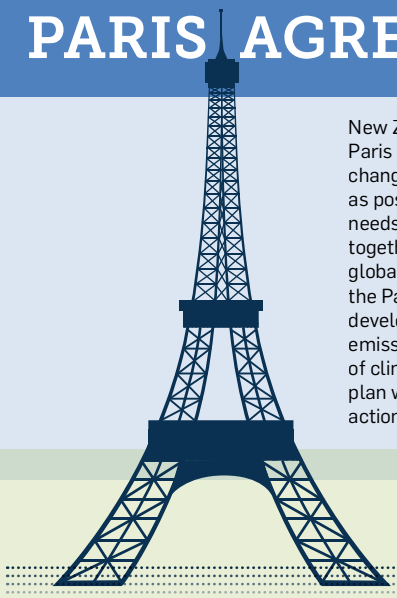
Source: IPCC Fifth Assessment Report (2014)

The red and blue plumes represent warming under extreme high- and low-emissions scenarios.

The black line represents past observed temperatures. Similar year-to-year variability will continue.

Climate change is a global challenge

PARIS AGREEMENT



New Zealand signed the historic Paris Agreement on climate change and will ratify it as soon as possible. To come into force it needs ratification by 55 countries, together responsible for 55% of global emissions. All countries in the Paris Agreement are asked to develop a long-term plan to reduce emissions and adapt to the impacts of climate change. New Zealand's plan will shape our climate change action over the coming decades.

IF THE WORLD DOES NOT ACT

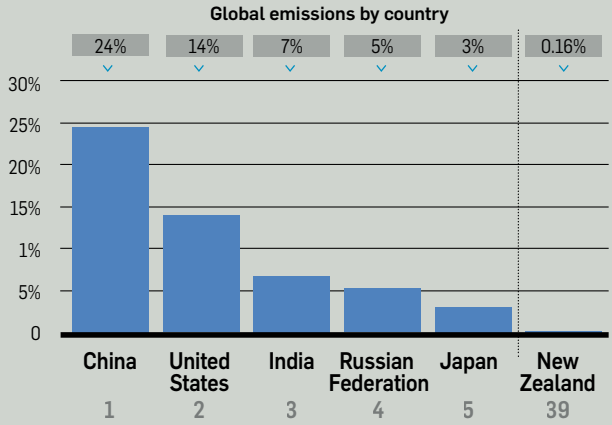
CLIMATE CHANGE MAY COST UP TO

20% **~ OF ~ GLOBAL GDP BY 2100**

Source: Nature 2015

but action will create new industries, jobs and opportunities to improve health and the environment

We all have a part to play



Our contribution matters:

NEW ZEALAND'S SHARE of global emissions IS JUST 0.16%

BUT small emitters like us together make up about 30%

Source: World Resources Institute (2012 data) and NZ's Greenhouse Gas Inventory 1990-2014 Snapshot

Timeline of key international climate change action

1988 — IPCC* set up by UN

1994 — UNFCCC** enters into force

1997 — Kyoto Protocol*** agreed

2005 — Kyoto Protocol in force

2009 — Copenhagen lays ground-work for future negotiations

2012 — Kyoto Protocol 1st commitment period ends; NZ meets its target; 2nd commitment period agreed

2015 — Paris Agreement negotiated

2016 — New Zealand signs Paris Agreement and plans to ratify by November

* Intergovernmental Panel on Climate Change establishes scientific underpinning of international negotiations

** United Nations Framework Convention on Climate Change aims to stabilise greenhouse concentrations in the atmosphere and prevent dangerous human impacts on our climate

*** Kyoto Protocol is the world's first legally binding greenhouse gas emissions reduction treaty

New Zealand's situation

NEW ZEALAND'S TARGET:

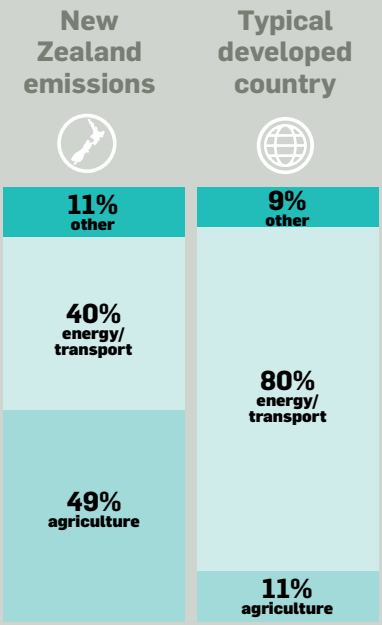
REDUCE EMISSIONS BY

30% ~ below ~ 2005 levels by 2030

New Zealand faces different challenges in reducing emissions compared to most other developed countries.

Almost half our emissions come from agriculture and most of our electricity is already from renewable sources. This means we have few cost-effective options for cutting emissions. New Zealand plans to meet its 2030 target by purchasing emission reductions overseas, forestry, and domestic emissions reductions. We will have to develop and adopt better practices and new technologies to reduce emissions from farming, industrial energy and transport.

We will need to adapt and become more resilient to the changes that are coming.



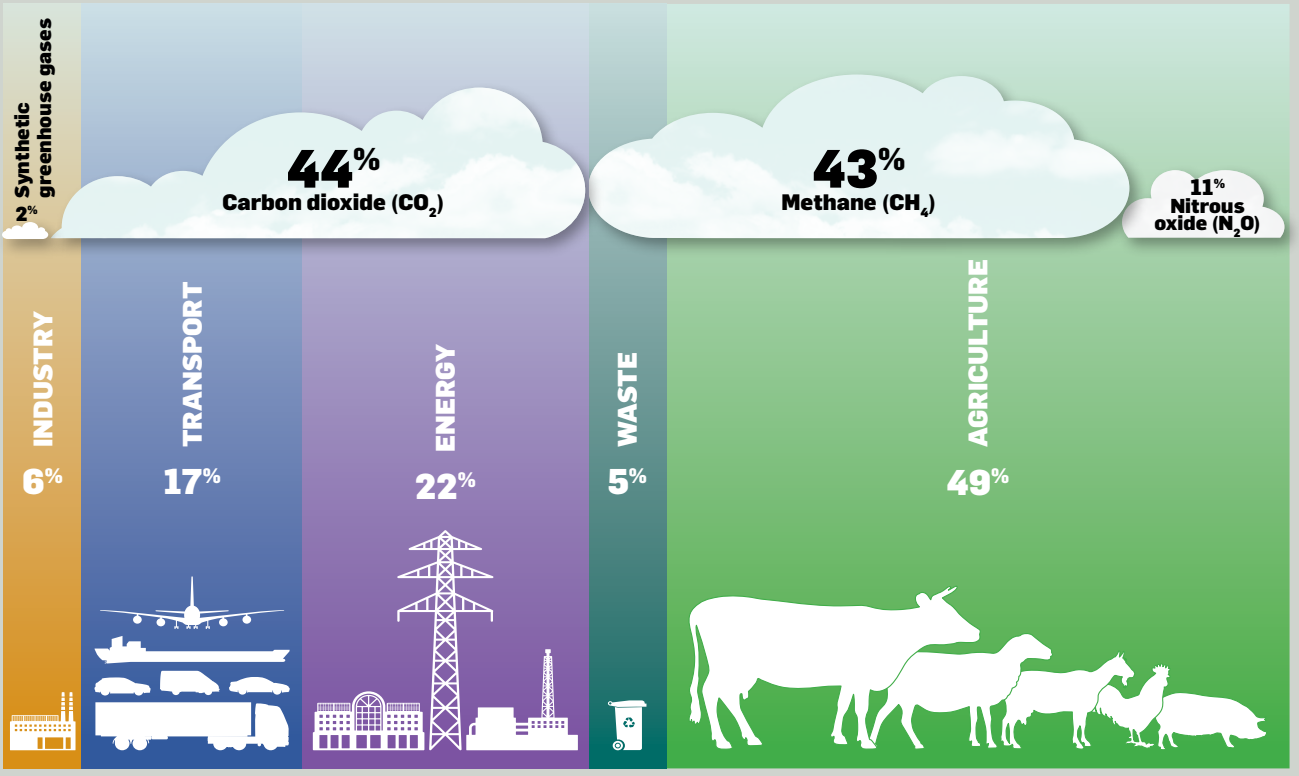
81% OF NZ'S ELECTRICITY WAS FROM RENEWABLE SOURCES IN 2015.

OUR TARGET: **90% BY 2025**

Source: Ministry of Business, Innovation and Employment

Sources of New Zealand's emissions

**Percentages have been rounded to the nearest whole number*



Source: NZ's Greenhouse Gas Inventory 1990–2014, Ministry for the Environment

What New Zealand is doing about it

International momentum

Although we contribute a very small percentage of global emissions, New Zealand has a strong and respected voice in international meetings on climate change. We are leading the push to eliminate inefficient fossil fuel subsidies, and providing funding for international research on reducing emissions from agriculture. Our expertise helps build global understanding of the science, and we help develop international climate change responses and reporting rules.

Removing fossil fuel subsidies would

REDUCE GLOBAL EMISSIONS

UP TO 10% BY 2050

Overseas aid

New Zealand-funded projects in the Pacific include improving access to clean, efficient and affordable energy; building public infrastructure that can withstand storms and rising sea levels; strengthening natural disaster preparedness and response efforts; and improving access to water such as by harvesting rainwater on drought-prone atolls.

New Zealand is providing up to

$200 million

for climate-related support, most of which will benefit Pacific island countries

Source: Ministry of Foreign Affairs and Trade

CASE STUDY:

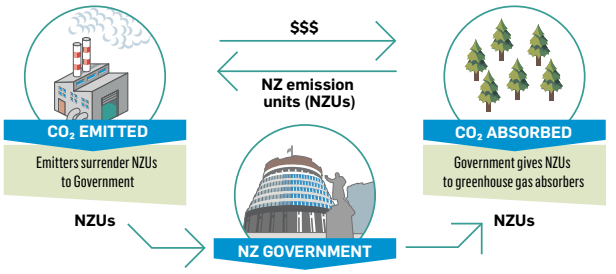
'Borrow pits' remediation

New Zealand has funded the filling of 'borrow pits' on Tuvalu's main atoll. The pits were dug during World War II when US Army forces excavated (or 'borrowed') material from parts of the atoll to construct a runway. Over time the pits filled with rubbish and became a health hazard. The $10 million remediation project has filled in the pits, increasing the available land area of Funafuti atoll by 6%, meaning improved resilience to storm surges and sea level rise, reduced health risk, and a significantly improved quality of life for Funafuti's residents.

Credit: Tom Henderson, Calibre Consulting Limited

Emissions Trading Scheme

The NZ ETS is our key tool for reducing emissions. It puts a price on emissions which creates a financial incentive for businesses to invest in technologies and practices that reduce emissions. It also encourages foresters to grow more trees, by giving them a financial benefit for the carbon their trees remove from the atmosphere. The NZ ETS was one of the first in the world to be established.



Research and education

Public and private organisations undertake research and education on a range of climate-related initiatives like forestry, agriculture, biofuels, energy and fuel efficiency, health and wellbeing, reducing waste, smarter transport and liveable cities. They facilitate data collection and information-sharing, develop new products and practices, and provide evidence for decision-makers.

In 2015/16 Government invested

$31 million

ON RESEARCH INTO UNDERSTANDING CLIMATE CHANGE AND ITS IMPACTS

CASE STUDY:

Science and traditional knowledge connect

Crown Research Institute GNS Science and Ngāti Kahungunu are exploring the connections between science and mātauranga-a-iwi, or traditional knowledge. With about 500 km of coastline, the rohe of Hawke's Bay and Wairarapa iwi is susceptible to sea level rise, so understanding how climate change is going to affect the area is very important. Through interactive marae-based learning, participants are developing their understanding on issues critical to iwi development, resilience, and environmental sustainability.

Credit: Fiona Coyle, GNS Science

Adaptation

Each part of the country will be affected differently by climate change so preparing for and managing the risks is the job of local government. Councils are best placed to know what is right for their region, and must incorporate climate change into their plans, projects and decision-making.

The Resource Management Act

requires councils to consider the effects of a changing climate on communities

Examples: flood management, water resources, planning, building regulations and transport

The Ministry for the Environment produces guidance to help local and central government plan for climate impacts like extreme weather events and sea level rise. We're also working on national direction for communities on managing risks from climate-related natural hazards.

The Ministry for Primary Industries contracted AgResearch and Scion to develop an adaptation digital library called the Climate Cloud (www.climatecloud.co.nz). This is an online collection of resources on the risks, impacts and solutions for adverse events, weather, and climate change in land-based businesses to help managers understand and respond to the challenges and opportunities of climate change.

CASE STUDY:

Virtual adaptation

Realistic computer-generated scenarios are being used to develop capability and understanding of adapting to climate-related sea-level rise and changing river flows. Victoria University of Wellington, the Wellington and Tasman councils, and the Ministry for the Environment have adapted a Dutch online 'game' that simulates New Zealand conditions. It has multiple real-life applications: councils can use it to develop a sustainable plan for regions subject to floods or sea level rise. Or universities can use it to teach students about risks and adaptation options. Planning decisions can be adjusted over time, as the users see the impacts of their decisions on both the environment and the economy.

Credit: Deltares Research Institute, Netherlands

Monitoring and reporting

The Government regularly publishes information on the amount, composition and sources of New Zealand's greenhouse gas emissions and removals, and tracks our progress towards meeting our international climate change commitments. We report on carbon markets and activity in the NZ ETS. The Parliamentary Commissioner for the Environment independently investigates and reports on environmental concerns.

Agriculture

Emissions from agriculture are a big issue for New Zealand. The sector is responsible for nearly half of our reported emissions. Our farmers are resilient and adaptive – more efficient farming contributes to emissions reductions, economic growth, and global food security. Total greenhouse gas emissions from agriculture have increased 15% since 1990. Without efficiency improvements, the emissions would have increased by more than 40% to deliver the same amount of product. Research, innovation, improved farm and pasture management, animal genetics and breeding are key for reducing the emissions from this sector.

New Zealand is a leading member of 46 countries involved in collaborative global research to grow more food without growing greenhouse gas emissions. As part of the Global Research Alliance on Agricultural Greenhouse Gases we support international research. We also run study tours for farmers and technical training for scientists and greenhouse gas inventory specialists. This raises awareness of the impact of existing practices and encourages changes that improve productivity and reduce the greenhouse gases an animal produces over its life.

We are investing

$20 million

a year in agricultural greenhouse gas research

CASE STUDY:

Microbes against methane

New Zealand-led research analysed the microbes causing methane emissions in ruminant animals around the world. It found similar microbes in nearly all ruminant species and diets. This means new technologies to reduce emissions by influencing rumen microbes could be used globally.

Credit: NZ Agricultural Greenhouse Gas Research Centre

Business

Many businesses are setting their own targets and plans for improving energy efficiency and reducing emissions. Some are voluntarily seeking 'green' credentials as customers increasingly demand environmentally friendly products and services. Landcare Research subsidiary Enviro-Mark Solutions provides certification programmes to help businesses with their carbon footprint and environmental and energy management. CEMARS, carboNZero, Energy-Mark and Enviro-Mark certification offer independent assurance that a business is making changes that are both good for business and the environment. Through certification, businesses can save money, improve competitive advantage, and strengthen their reputation.

Forestry

Forests absorb CO_2 which helps offset our emissions. There is also increasing understanding of the environmental and social benefits we get from forests. For example, forests can help control soil erosion, improve economic returns from marginal land, and improve water quality. Government and community schemes are in place to encourage tree planting. The Government also supports innovative forestry projects and sustainable forestry management. The Permanent Forest Sink Initiative, for example, encourages the establishment of permanent forests in recognition of the additional environmental and ecosystem benefits that permanent forests provide. The Afforestation Grants Scheme will plant 17 million trees on 15,000 hectares by 2020.

Forests cover

37% OF NZ

AND OFFSET 29% OF OUR EMISSIONS

Source: NZ's Greenhouse Gas Inventory 1990-2014, Ministry for the Environment

CASE STUDY:

Sweet alternative for manuka

Alongside the success of manuka honey, research is looking at manuka plantations for reducing erosion and storing carbon. Hawke's Bay Regional Council, Landcare Research and the Ministry for Primary Industries are investigating the planting density needed to reduce erosion without limiting flowering and honey production. They are also measuring the growth of the plants to assess their potential to store carbon.

Credit: Ministry for Primary Industries

Transport

We are improving public transport, extending and upgrading urban cycleways, promoting a switch to low emissions vehicles, investing in rail upgrades and new trains, and running information campaigns. Businesses are running biofuel, fuel and freight efficiency programmes.

We are spending a record

$1.2 billion

on public transport

Electric Vehicles Programme

The Government has an ambitious and wide-ranging package of measures to increase the uptake of electric vehicles. Its target of doubling the number of EVs every year to reach approximately 64,000 by 2021 will help reduce transport emissions.

ELECTRIC VEHICLES:

80% **LOWER CO_2 EMISSIONS THAN PETROL**

(due to NZ's high level of renewable electricity)

Energy

Businesses are making changes which reduce emissions, and provide other benefits including cost savings by improving heat recovery in industrial processes, switching to renewable fuels, and converting waste to biogas. Improved energy management and upgrading equipment can cut a business's energy use by up to 20%. Reducing waste by recycling, recovering, or reusing materials means fewer emissions and cuts the cost of using landfills. Biogas from landfills provides renewable energy.

CASE STUDY:

Waste not, want not

Waste Management's Redvale Energy Park and Landfill is a $200 million investment in clean-tech sustainable waste management innovation. It is the largest renewable 'energy from waste' producer in New Zealand. The Government requires large landfills to capture methane. Redvale captures 90% of the methane it produces, which generates enough electricity to power 12,000 homes.

Credit: Waste Management NZ Limited

We need to do more

We all need to work on ways to cut our emissions, adapt to the effects of climate change, and become more resilient to the changes that are coming.

We're not starting from scratch. Government, businesses, researchers and communities are already working on the challenges posed by climate change. As we face the realities of a warming climate, policies across all sectors must contribute to reducing emissions, help us adapt to inevitable environmental, economic and social changes, and make the most of new opportunities.

Looking ahead

The Government is establishing three new groups to support New Zealand's efforts to address climate change. These expert groups on adaptation, agriculture and forestry will supplement cross-agency work already in train across sectors, and will provide advice on the key climate change issues New Zealand faces:

Adaptation

How New Zealand responds to a changing climate will be of critical importance. The Adaptation Group will look at what more needs to be done to adapt to climate change and how that will impact on our economy and society.

Agriculture

Almost half New Zealand's emissions come from agriculture, but so does much of our national income. We are working with the farming sector on how to reduce biological emissions from agriculture while taking advantage of new opportunities.

Forestry

Forests are important as they help to offset our emissions and provide economic, environmental and social benefits. The Forestry Group will look at how the sector can do more to help New Zealand meet its climate change targets.

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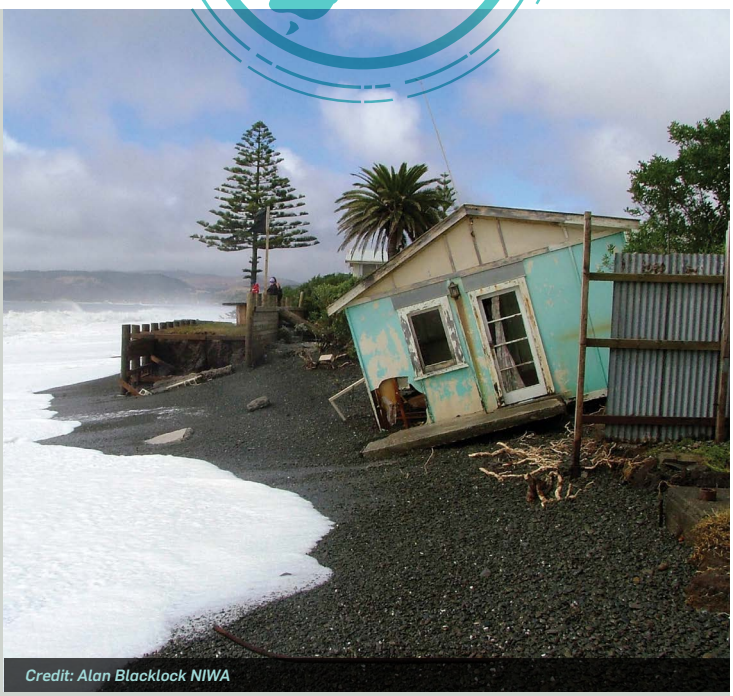

Storm damage at Haumoana

Strengthening the NZ ETS

We are reviewing the NZ ETS to ensure it helps us meet our climate change targets and move towards a low emissions economy. The Government is phasing out the 'one-for-two' measure that allowed some industries to pay half price for their emissions. The focus is now on working with business to get the NZ ETS in shape for meeting our Paris target and driving greater investment in forestry and low emissions technologies.

Reducing HFCs

New Zealand is working with other countries to phase down the use of hydrofluorocarbons or HFCs. These gases are used in refrigeration and air conditioning systems. While kinder to the ozone than previous products, they have been found to be serious greenhouse gases. Ending the use of HFCs could cut New Zealand's greenhouse gases by 2% and prompt innovation as businesses develop replacement products over time.

Energy targets

We need to broaden our renewable advantage beyond electricity into our total energy use and productivity, so we are developing new energy targets to send a strong signal about what our energy future should look like. These will sit alongside our existing target of 90% renewable electricity by 2025.

We are also updating the New Zealand Energy Efficiency and Conservation Strategy to support these targets.