Te Kāwanatanga o Aotearoa
New Zealand Government

Te hau mārohi ki anamata

Transitioning to a low-emissions and climate-resilient future

AOTEAROA NEW ZEALAND'S LONG-TERM
LOW-EMISSIONS DEVELOPMENT STRATEGY

Published in November 2021
by the Ministry for the Environment
Manatū Mō Te Taiao
PO Box 10362, Wellington 6143,
New Zealand

ISBN: 978-1-99-003393-3
Publication number: ME 1607

This document is available on the
Ministry for the Environment website:
environment.govt.nz

CONTENTS

A message from the Minister of Climate Change

In Aotearoa New Zealand, tens of thousands have taken to our streets in climate strikes, focusing attention on the climate crisis and demanding greater urgency. This is reflected across the political spectrum, with Parliament unanimously passing the Zero Carbon Act in 2019.

The private sector is also mobilising, with companies individually and collectively committing to measuring and reporting their emissions, adopting emissions reduction targets and taking the temperature goals in the Paris Agreement seriously.

In its most recent report, the Intergovernmental Panel on Climate Change warned that the world will exceed warming of 1.5°C and 2°C during the 21st century unless there are deep cuts to greenhouse gas emissions in the coming decades.[1]

This means immediate, rapid and large-scale action is needed to avoid a climate catastrophe. However, it also gives us an opportunity to reshape our economy and society, and reap significant environmental, economic and health co-benefits.

Making the most of this opportunity requires a collective effort involving central and local government, iwi and hapū, as well as businesses, households, communities, and every sector of the economy.

We are currently consulting on proposals for the emissions reduction plan, which must be published by 31 May 2022. This will set out how we will achieve the first emissions budget, while also alleviating the impacts policies may have on employers and employees, regions, iwi and Māori, and wider communities. It is critical that New Zealanders have a say in how we move to a low-emissions and climate-resilient future.

In the meantime, this document – the first part of our emissions reduction plan – sets out our long-term vision, as well as how sectors and systems across the economy will contribute to this vision. It also describes our national circumstances and sets the scene for the detailed policies and strategies that follow in May 2022.

This is a critical step. It reiterates our commitment to a low-emissions, climate-resilient future for Aotearoa New Zealand and to playing our part in the fight to stop the climate crisis.

HON JAMES SHAW
MINISTER OF CLIMATE CHANGE

1 Intergovernmental Panel on Climate Change. 2021. *Climate change 2021: The physical science basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. 2021.

Transitioning to a low-emissions and climate-resilient future

Aotearoa New Zealand's climate change mitigation strategy

Vision:
A productive, sustainable and inclusive economy

Purpose:
To contribute to the global effort to limit warming to 1.5°C above pre-industrial levels

Targets:
Net zero long-lived gases by 2050 and a 24–47% reduction in biogenic methane by 2050

Emissions budgets and emissions reduction plans

2046–50: Sixth emissions budget (set 2035) and emissions reduction plan (published 2044)
2041–45: Fifth emissions budget (set 2030) and emissions reduction plan (published 2039)

3 Nationally Determined Contribution

2036–40: Fourth emissions budget (set 2025) and emissions reduction plan (2034)
2031–35: Third emissions budget (set 2022) and emissions reduction plan (published 2029)

2 Nationally Determined Contribution

2026–30: Second emissions budget (set 2022) and emissions reduction plan (published 2024)
2022–25: First emissions budget (set 2022) and emissions reduction plan (published 2022)

1 Nationally Determined Contribution

Our long-term emissions reduction strategy

System settings

- Government accountability and coordination
- Funding and finance
- Emissions pricing
- Behaviour change
- Planning and infrastructure
- Research, science, technology and innovation
- Circular economy and bioeconomy

Sector plans

- Transport
- Energy and industry
- Building and construction
- Waste and F-gases
- Agriculture
- Forestry and nature-based solutions
- International cooperation

Equitable transition

- Māori
- Regional communities
- Skills and education
- Workers
- Population groups

Empower New Zealanders

Māori | Central government | Local government | Private sector | Civil society

Our current reality

Gross emissions: **82.3 Mt CO_2-e**

Net emissions: **54.9 Mt CO_2-e**

Change since 1990: **+ 26%**

Climate change is the greatest challenge of our time. The impacts are already being felt in Aotearoa New Zealand, in the Pacific and around the world.

Avoiding worse effects means urgently **reducing greenhouse gas emissions** and **limiting global average temperature rise to 1.5°C above pre-industrial levels**. We also need to adapt to the impacts that are already locked in.

The future wellbeing, security and prosperity of New Zealanders depends on climate action. Aotearoa will play its part by contributing to the global fight against climate change, standing with the Pacific and building a low-emissions and climate-resilient future.

Vision

The vision for Aotearoa New Zealand is to build thriving, sustainable communities that are good for people and that function within the limits of our planet. We envisage a productive, sustainable and inclusive economy where:

- economic activity is nature-enhancing, carbon neutral, circular and climate resilient
- energy and transport systems are accessible, affordable and sustainable
- production systems are regenerative, providing a way for Aotearoa to innovate and invest to meet future challenges
- every household can meet its material needs, in turn reducing child poverty
- partners under Te Tiriti o Waitangi (Te Tiriti)[2] work together to realise mutually beneficial economic opportunities and their obligations as kaitiaki (guardians).

We have the chance to use the unique strengths of Aotearoa to turn global climate challenges into economic solutions.

We can transform the economy to be more productive, innovative, circular and sustainable.

Our aim is to be globally competitive in a net-zero emissions world and to create a better future for this generation and those to come.

Achieving this future means:

- making significant and urgent cuts in our greenhouse gas emissions and expanding our carbon sinks, so that we achieve our 2050 targets and contribute to global efforts to limit warming to 1.5°C above pre-industrial levels
- transitioning in a way that enhances New Zealanders' wellbeing and creates jobs, new industries, sustainable business models, resilient communities and a healthy environment
- building people's skills to drive and adapt to the transition
- partnering with Māori and honouring the Government's obligations under Te Tiriti.

The Government is putting in place an ambitious programme of investment in actions to accelerate our transition. These will move Aotearoa away from fossil fuels; increase investment in energy efficiency, renewable energy and bioresources; and reduce agricultural emissions through emissions pricing and emerging technologies and practices. There is also scope for greater investment in forestry.

This journey will be challenging. All New Zealanders must play their part and work together in innovative ways to reduce emissions and set the economy up for success in a low-emissions world.

There are also significant co-benefits: new jobs, new markets and opportunities for Kiwi businesses, a more renewable energy system, a more sustainable agriculture sector, less air pollution, warmer and drier homes, improved public health, new technologies, protection of native species and ecosystems, cost savings for businesses, and overall resilience.

2 Te Tiriti o Waitangi (the Treaty of Waitangi) is an agreement between the British Crown and around 540 Māori rangatira (chiefs), which was first signed on 6 February 1840. It is regarded as Aotearoa New Zealand's founding document and has led to the development of principles that form the basis of Crown–Māori relationships today. These principles include partnership, active protection of Māori interests and participation.

Purpose

Our main purpose is to urgently reduce greenhouse gas emissions and increase carbon sinks, so that we meet our domestic emissions reduction targets.

In doing so, we will also contribute to global efforts to limit temperature rise to 1.5°C.

WHY WE NEED TO LIMIT TEMPERATURE RISE TO 1.5°C

It is critical that the world limits warming to 1.5°C above pre-industrial levels. Any additional warming will increase the impacts of climate change.

Any warming over 1.5°C will increase the severity and frequency of extreme heat events, the intensity of rainfall and the risk of drought. As flooding, water scarcity and extreme weather events worsen, they will affect industries and the economy.

Compared with 2°C, limiting warming to 1.5°C is projected to protect up to 10 million people from risks associated with sea-level rise. Limiting warming to 1.5°C could reduce the proportion of the world population exposed to water stress induced by climate change by up to 50 per cent.[3]

Limiting temperature rise to 1.5°C is expected to make it easier for ecosystems, food and health systems to adapt, and estimated costs of adaptation may be lower.

Limiting warming means reducing anthropogenic (produced by humans) emissions of carbon dioxide (CO_2) to net zero. Under the 1.5°C limit, net-zero CO_2 probably needs to be achieved by around 2050. Emissions of non-CO_2 gases, like methane and nitrous oxide, also require deep reductions, though not necessarily to zero. Long-term, net negative emissions and additional reductions in non-CO_2 emissions may be needed to prevent further temperature increases and minimise sea-level rise.

As part of its sixth assessment report, the Intergovernmental Panel on Climate Change recently released a new report, *Climate Change 2021: The Physical Science Basis*. This provides new estimates of the chances of crossing the global warming level of 1.5°C in the next decades. It finds that, unless there are immediate, rapid and large-scale reductions in greenhouse gas emissions, the 1.5°C and 2°C temperature goals in the Paris Agreement will be beyond reach.[3]

3 Intergovernmental Panel on Climate Change. 2021. *Climate change 2021: The physical science basis*. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press. 2021.

Targets

In 2019, Aotearoa legislated a series of emissions reduction targets for the first time.

The Climate Change Response Act 2002 requires that all greenhouse gases, other than biogenic methane, reach net zero by 2050.

Separate targets for biogenic methane emissions require a 10 per cent reduction by 2030 and a 24–47 per cent reduction by 2050 (compared with 2017 levels).

This approach reflects the different warming effects that greenhouse gases have on the atmosphere. It also acknowledges the emissions profile of Aotearoa and will effectively drive change across the economy.

BIOGENIC METHANE EMISSIONS IN AOTEAROA

The high level of agricultural production in Aotearoa means we produce a lot of methane and nitrous oxide. These have a greater warming effect than carbon dioxide.

Nearly half (48 per cent) of our gross emissions come from the agriculture sector. Most of these emissions are biogenic methane, with the sector contributing around 91 per cent of our total biogenic methane in 2019 (the remaining 9 per cent came from the waste sector). Typically, agriculture constitutes only a small proportion of gross emissions in other countries.

Emissions budgets and emissions reduction plans

Emissions budgets

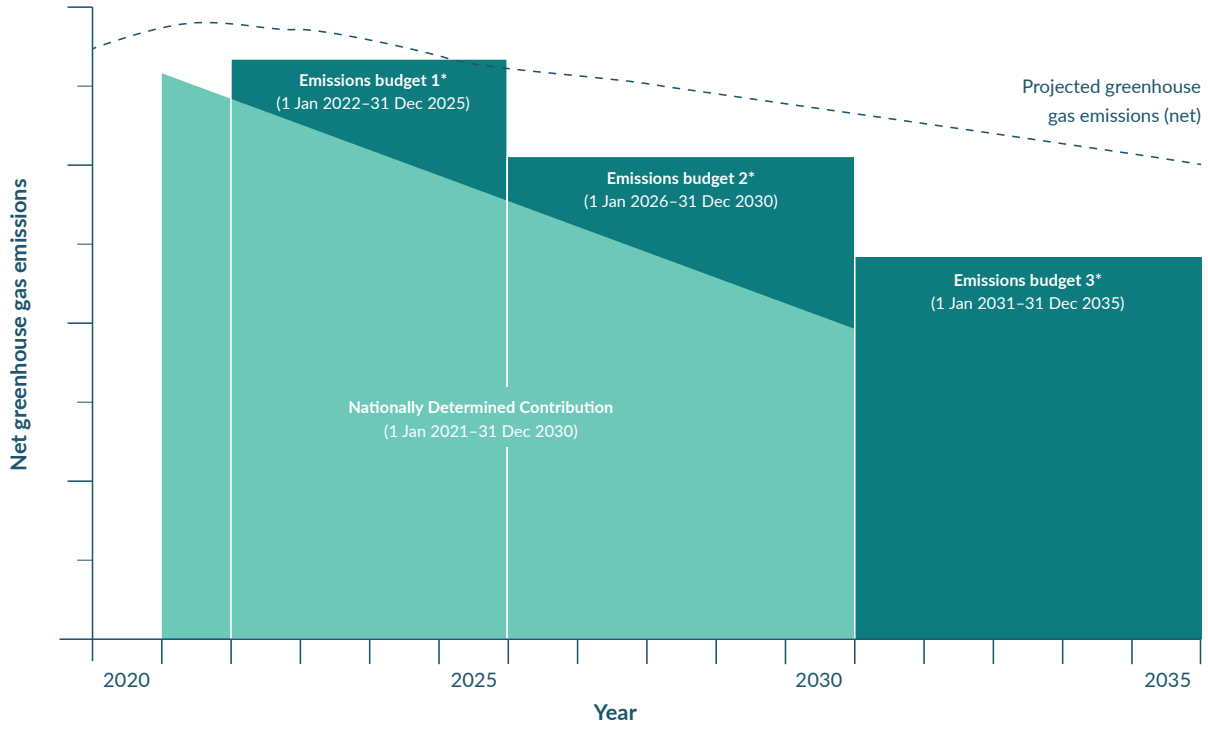
Emissions budgets set the pace of our transition. They specify the amount of greenhouse gas emissions that are permitted over a five-year period or, in the case of the first emissions budget, over four years. The emissions budgets act as interim targets that step towards the 2050 target.

Emissions budgets focus on reducing emissions in Aotearoa. For this reason, they must be met – as far as possible – through domestic action to reduce emissions and increase removals, for example, through forestry.

The use of offshore mitigation to achieve the emissions budgets is strictly limited.

On 31 May 2021, the Climate Change Commission advised the Government on the first three emissions budgets (2022–2025, 2026–2030, 2031–2035). The Government must set the first three emissions budgets by 31 May 2022.

Figure 1. Relationship between emissions budgets and Nationally Determined Contributions



*The Government will make final decisions on the first three emission budgets by 31 May 2022

NATIONALLY DETERMINED CONTRIBUTIONS

Aotearoa is committed to the Paris Agreement and will set progressively ambitious Nationally Determined Contributions (NDCs). An NDC is a commitment to reduce global emissions over a given period. Each NDC must represent our highest possible ambition for contributing to efforts to reduce global emissions.

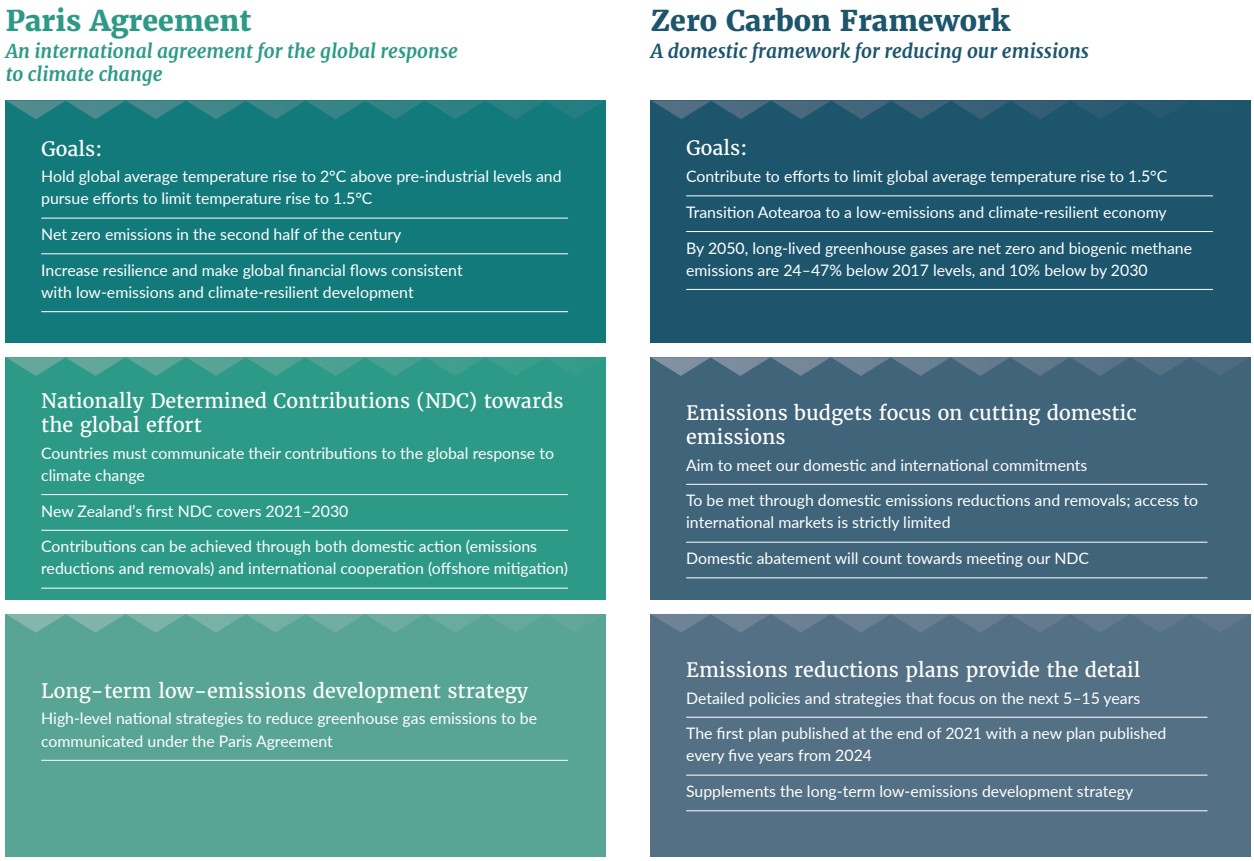
Aotearoa recently updated its NDC, committing to reduce net emissions to 50 per cent below gross 2005 levels by 2030. This corresponds to a 41 per cent reduction using a multi-year emissions budget starting from the 2020 emissions target. The update to the NDC followed advice from the Climate Change Commission in May 2021.

Our NDC is our contribution to reducing global emissions, and this can be met through a combination of domestic emissions reductions, removals from forestry within Aotearoa, and international cooperation to access offshore mitigation with environmental integrity under Article 6 of the Paris Agreement.

In comparison, reducing domestic emissions and transitioning our economy are the focus of the domestic 2050 target, emissions budgets and emissions reduction plans. As noted above, these must be achieved by taking action at home.

In using international cooperation (such as international carbon markets) to drive mitigation action offshore for the purposes of meeting our NDC, Aotearoa is committed to ensuring environmental integrity, robust accounting and transparency, and supporting sustainable development. See further details on our approach to carbon market cooperation.

Figure 2. Pillars of the Paris Agreement and Zero Carbon Framework



Emissions reduction plans

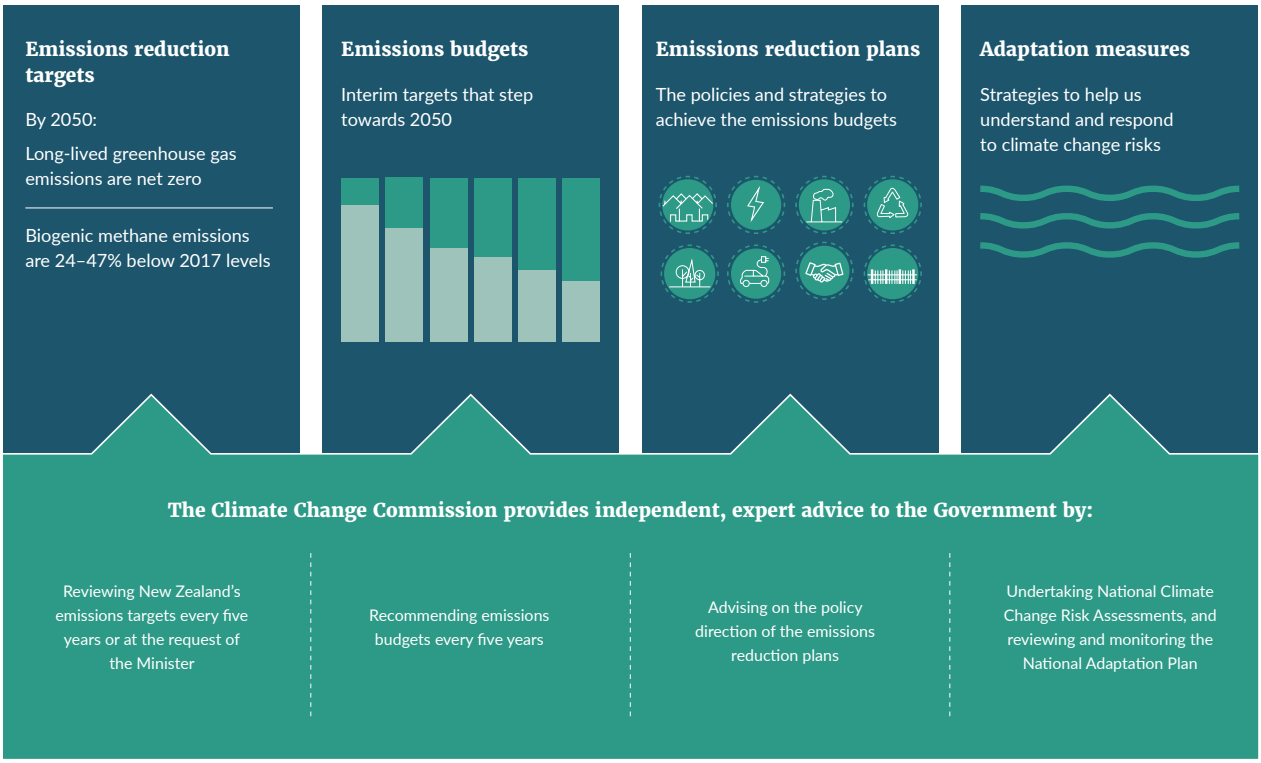
Emissions reduction plans are one of the main requirements in the Zero Carbon Framework (figure 3). This was introduced through amendments to our primary piece of climate change legislation, the Climate Change Response Act 2002. Among other things, these amendments:

- referenced the 1.5°C temperature goal in our climate change legislation
- legislated domestic targets for 2050, which require biogenic methane emissions to reduce by 24–47 per cent and all other gases to reach net zero[4]
- set up a framework of emissions budgets and emissions reduction plans to manage the transition between now and 2050.

By 31 May 2022, the Government will publish:

- the first three budgets (2022–25, 2026–30 and 2031–35)
- the first emissions reduction plan.

Figure 3. Zero Carbon Framework



4 These targets were informed by the Intergovernmental Panel on Climate Change's special report on the impacts of global warming at 1.5°C.

This document is Part I of the first emissions reduction plan

The emissions reduction plan will detail how Aotearoa will meet its first emissions budget, and put the country on a path to meet future emissions budgets and the 2050 target.

The plan also serves as our long-term low-emissions development strategy for the purposes of the Paris Agreement,[5] and will be published in two stages (figure 4).

Part I is the first stage. This sets out the current reality in Aotearoa, how the emissions reduction plan fits into the country's wider climate response, and the long-term strategy for each sector and system covered by the plan.

The second stage involves publishing the full emissions reduction plan in May 2022, following public consultation in October–November 2021 and final decisions. This will include detailed policies and strategies for:

- making an equitable transition, including through a fair distribution of costs and benefits, strong partnerships, and ensuring iwi, Māori, businesses and communities have a leading role
- aligning system settings across sectors to enable a streamlined transition throughout the country
- reducing emissions in the key sectors of the economy, increasing removals in the first emissions budget period and setting us up for success in the long term.

Figure 4. Development of the emissions reduction plan

February–March 2021	The Climate Change Commission consulted on recommendations for the first three emissions budgets and the direction of policy for the emissions reduction plan
31 May 2021	The Government received the Commission's final advice
August 2021	The Government made in-principle decisions on the levels of the first three emissions budgets
October–November 2021	Government consultation on new proposals for the first emissions reduction plan *(The final plan may include other policies and strategies that are subject to separate consultation.)*
November 2021	Publish the first part of the emissions reduction plan
31 May 2022	Publish the first three emissions budgets in the *New Zealand Gazette*. Publish the full emissions reduction plan

5 Paris Agreement, Article 4, paragraph 19.

Our current reality

National circumstances

Aotearoa New Zealand and our place in the Pacific

- Aotearoa lies in the South Pacific and is part of the Realm of New Zealand (along with the Cook Islands, Niue, Tokelau and the Ross Dependency).
- Tokelau is a territory of Aotearoa. Our ratification of the Paris Agreement was extended to Tokelau in 2017, and Tokelau's emissions are included in the New Zealand Greenhouse Gas Inventory.

Government

- Aotearoa has an unwritten constitution and is a constitutional monarchy. Queen Elizabeth II is our Head of State.
- Executive central government is formed from a democratically elected House of Representatives.
- Parliament consists of the House of Representatives and the Sovereign. Its principal functions are to enact laws and hold the Government to account.
- Local government has devolved responsibility for local planning and resource management.

Te Tiriti o Waitangi

- Māori are tangata whenua, the indigenous people of Aotearoa.
- Te Tiriti o Waitangi (the Treaty of Waitangi) is our founding document and the source of principles that govern Crown–Māori relationships.
- These principles include partnership, participation and the active protection of Māori knowledge, interests, values and other taonga.
- The principles of Te Tiriti mean that partnership is a fundamental part of our transition to a low-emissions, climate-resilient economy.

Geography

- Aotearoa is long, narrow and mountainous, with a combined land area of around 27 million hectares and 17,200 kilometres of coastline.
- We have one of the largest exclusive economic zones (EEZs) in the world.
- Grassland for agriculture, natural forest and plantation forestry form our main land cover.
- One-third of our land area (mainly natural forest) is protected for conservation purposes.

Our population

- Aotearoa has a population of 5.1 million people (March 2021).
- Our population has increased from 3.5 million in 1991 and could reach 6 million by 2050. This is largely driven by net migration to Aotearoa.
- The population is widely distributed, which contributes to emissions due to the need for transport (dominated by private petrol and diesel vehicles).

Economy

- In the year ended March 2021, our nominal gross domestic product (GDP) was NZ$325 billion (US$226.9 billion). Since 1990, our average annual economic growth rate has been 2.6 per cent.
- Our economy is based on services (about two-thirds of GDP) and the manufacturing and primary sectors.
- The primary sector (agricultural, horticultural, forestry, mining and fishing industries) directly accounts for around 8 per cent of GDP and contributes just over half of total export earnings. It is also an important employer.
- Before the COVID-19 pandemic, international tourism was an important source of income, directly contributing 5.8 per cent of GDP in 2019.
- Trade is critical. From 2008 to 2018, international trade made up 60 per cent of all economic activity.

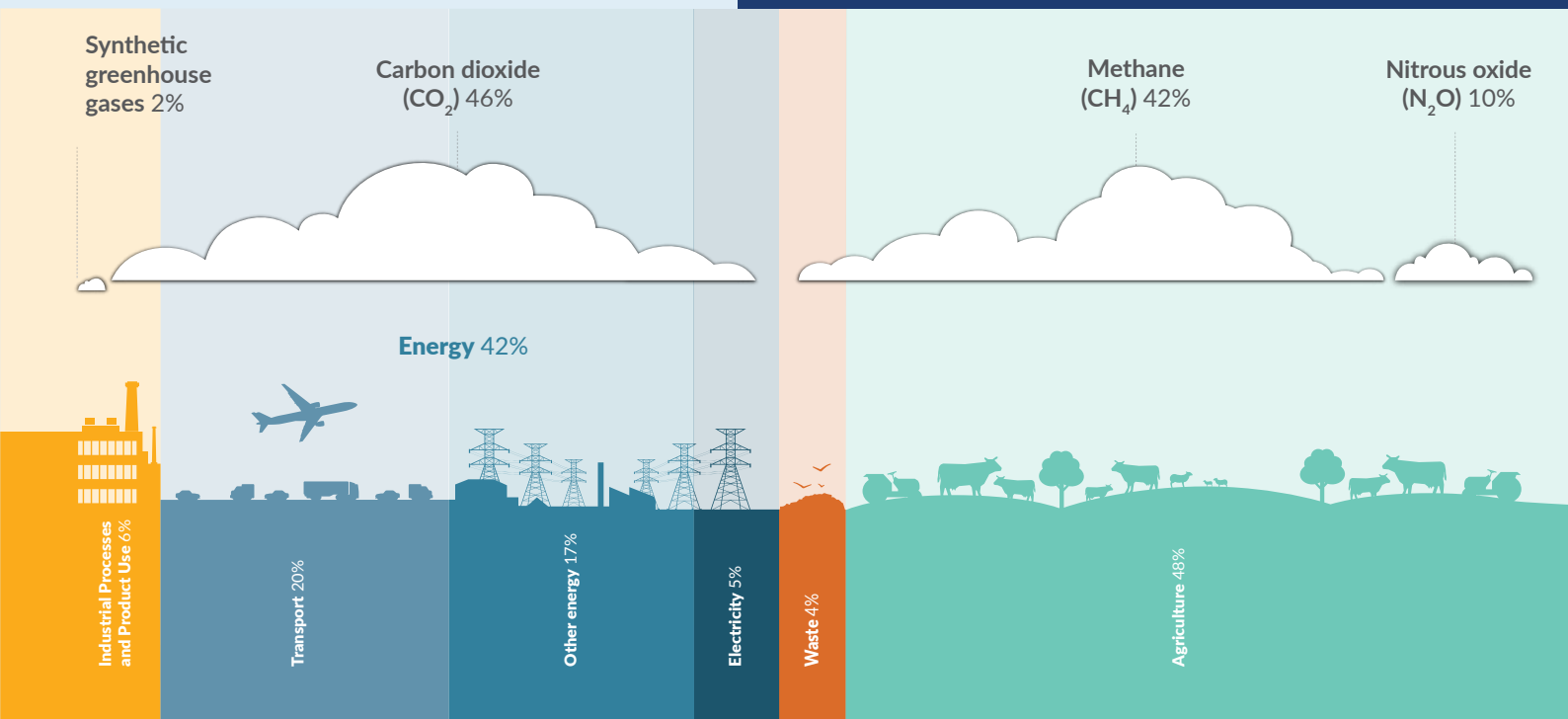
Emissions profile

- Our emissions profile is shaped by the size of the land sector (agriculture and forestry) relative to the population.
- Our largest sources and sinks of emissions are in the land sector:
  - in 2019, almost half of gross emissions were methane and nitrous oxide from livestock farming
  - in 2019, land use, land-use change and the forestry sector were responsible for net removals of 27.4 metric tonnes carbon dioxide equivalent (Mt CO_2-e) and offset 33 per cent of gross emissions.
- Energy[1] is the second largest source of emissions, contributing 42 per cent of gross emissions in 2019. Energy emissions are dominated by transport, manufacturing industries and the production of heat and electricity.

1 In the emissions reduction plan, transport emissions are separate from stationary energy and industrial process emissions.

Emissions trends

- In 2019, gross greenhouse gas emissions were 82.3 Mt CO_2-e and net emissions were 54.9 Mt CO_2-e.
- Gross emissions have grown 26 per cent since 1990.
- Energy and agriculture emissions have grown between 1990 and 2019.
  - Energy sector emissions have increased by 44.3 per cent, mainly due to increased use of fossil fuels in road transport, and in manufacturing and construction.
  - Agriculture sector emissions have increased by 17.1 per cent, mainly due to an 82 per cent rise in the size of the national dairy herd and a 662.7 per cent rise in the use of synthetic nitrogen fertiliser since 1990. This increase has been partially offset by a decrease in the populations of sheep, beef cattle and deer by 53.6 per cent, 15.3 per cent and 17.0 per cent respectively since 1990. The overall rise has also occurred despite successful efforts to reduce the emissions intensity of livestock on farms.
- While emissions have grown since 1990, they have been largely unchanged since 2003. This shows that emissions efficiency has been increasing and we seek to accelerate this trend.



Our climate change response

Climate change is a global problem that requires a global solution. Aotearoa is committed to doing its part and strengthening that global response. We do this by taking action domestically, in our region and globally. We aim to:

- **play our part in limiting global temperature rise to 1.5°C**. We take on and meet ambitious emissions reduction targets that are grounded in science; take steps towards a low-emissions economy; contribute to an effective multilateral climate response; provide climate finance and support; and contribute to international efforts to reduce emissions
- **adapt and build resilience to the adverse impacts of climate change.** We work to understand and adapt to the climate risks facing Aotearoa; we support others, particularly Pacific Island countries – recognising that climate change is the single greatest threat to livelihoods, security and wellbeing in the Pacific region
- **align financial flows and decision-making with the pathway towards low emissions and climate resilience.** We do this through international climate finance, pricing emissions, removing environmentally harmful subsidies (and pushing for others to do the same) and requiring climate-related financial disclosures.

The following three pages set out our climate change response and the role of the plan.

At home

Mitigation

Nationally Determined Contribution (NDC)
Our commitment to reduce *global emissions* between 2021 and 2030. Aotearoa recently updated its NDC to reduce net greenhouse gas emissions to 50 per cent below gross 2005 levels by 2030. This corresponds to a 41 per cent reduction using a multi-year emissions budget starting from our 2020 target.
See New Zealand's NDC.

Legislated domestic emissions reduction target
Our commitment to reduce *domestic emissions* (within New Zealand). The 2050 targets are: reduce biogenic methane emissions by 10 per cent by 2030, and by 24–47 per cent by 2050 (relative to 2017 levels); reduce emissions of all other gases to net zero by 2050.

Emissions budgets
Interim targets that limit the amount of domestic emissions permitted over a five-year period.

Emissions reduction plans
Policies and strategies for meeting emissions budgets and managing the impacts of the transition.

Emissions pricing
Emissions are priced through the New Zealand Emissions Trading Scheme and the Synthetic Greenhouse Gas Levy. The He Waka Eke Noa – Primary Sector Climate Action Partnership is working to price agricultural emissions from 2025.

Adaptation

National climate change risk assessment
A mandatory six-yearly assessment of the risks Aotearoa faces from climate change. It covers the natural environment, built environment, human, economic and governance domains. Read more.

National adaptation plan
Required every six years, this sets out what we must do to respond to the risks identified in the most recent national climate change risk assessment.

Information and reporting
The Minister of Climate Change or the Climate Change Commission may request certain organisations to provide information, including the risks faced and how they are managing these.

Climate Change Adaptation Act
We are developing legislation to address managed retreat and the funding and financing of adaptation. Read more.

Enablers

Climate Change Response Act 2002
Our primary legal framework for climate action in Aotearoa, which includes:

- the 'Zero Carbon Framework' to manage our transition to a low-emissions and climate-resilient future
- independent expert advice and monitoring of progress (via the Climate Change Commission)
- emissions pricing via the New Zealand Emissions Trading Scheme and Synthetic Greenhouse Gas Levy
- international climate change obligations including the legal framework to collect information and report on our domestic greenhouse gas emissions.

Data and evidence
We regularly report on emissions and removals, including through the New Zealand Greenhouse Gas Inventory, environmental reporting, biennial reports and national communications.

Aligning financial flows with low emissions and climate resilience
We are doing this by pricing emissions, removing environmentally harmful subsidies, requiring climate-related financial disclosures, funding low-emissions alternatives and research and development, and through our sovereign wealth fund practices.

In the Pacific

Standing with the Pacific

Ambition
We recognise the importance for the region of limiting temperature rise to 1.5°C. We have placed this at the heart of our climate change response, and we are working to influence others to align their actions with 1.5°C.

Sea-level rise and maritime zones
This year, Pacific Islands Forum leaders issued the Declaration on Preserving Maritime Zones in the Face of Climate Change-Related Sea-Level-Rise. This landmark declaration sets out our collective intention to maintain our maritime zones in the face of sea-level rise. It continues the region's proud record of leadership on oceans issues, while upholding the integrity of the United Nations Convention on the Law of the Sea.

Regional action
Aotearoa and other Pacific Islands Forum members have affirmed that "climate change is the single greatest threat to the livelihoods, security and wellbeing of the peoples of the Pacific" in the Boe Declaration and the Kainaki II Declaration. We will continue to pursue bold and innovative regional solutions to climate change.

Amplifying Pacific voices
As a Pacific country, Aotearoa will continue to support and amplify the voice of Pacific Island countries in global climate change processes.

Climate-related support

Aotearoa has increased its international climate finance commitment to $1.3 billion for 2022–2025. At least 50 per cent of this finance will be delivered in the Pacific.

This is a considerable change in scale in our climate finance commitments, and underlines the importance we are placing on global efforts for climate change action.

Partner-led approach
Our approach to climate-related support is based on partner countries' national plans and identified needs. We support capacity building targeted to activities, such as agriculture development, renewable electricity generation and building resilience to disaster risk.

Support for adaptation
A major focus is support for adaptation in the Pacific. Of our overall climate finance, at least 50 per cent will be used for adaptation although in the Pacific this proportion will likely be much higher given the priority the Pacific places on adaptation and resilience.

This support helps developing countries take practical action, including improving water and food security, protecting the oceans, strengthening ecosystems and improving access to climate science to support decision making.

In the world

Multilateral response

Paris Agreement
Aotearoa is committed to the global implementation of the Paris Agreement, and effective and ambitious global action. We champion environmental integrity and ambition in the rules for implementing the agreement, and the mechanisms that will allow scrutiny and give confidence in Parties' actions. Read more.

Maritime and aviation emissions
We are pushing for action to align international maritime and aviation emissions with limiting temperature rise to 1.5°C. This includes taking part in the International Maritime Organization and International Civil Aviation Organization negotiations on reducing greenhouse gas emissions from these sectors.

Cooperation

Developing solutions and sharing best practice
We champion international research on measuring and reducing agricultural emissions, by jointly establishing the Global Research Alliance on Agricultural Greenhouse Gases.

Innovative approaches
We co-launched the Agreement on Climate Change, Trade and Sustainability. This brings together some of the inter-related elements of the climate change, trade and sustainable development agendas.

International carbon markets
We advocate for international carbon markets with high environmental integrity via plurilateral processes (eg, the Ministerial Declaration on Carbon Markets and Asia–Pacific Carbon Markets Roundtable) and working bilaterally (eg, the Florence Process, International Carbon Action Partnership).

Trade for All
Trade for All will help ensure that our trade policy delivers for all New Zealanders and contributes to addressing issues such as climate change.

Advocacy and support

Climate-related support
A significant amount of our $1.3 billion climate finance commitment will be spent outside the Pacific and include support for mitigation and adaptation initiatives.

Fossil fuel subsidy reform
We are a leading advocate for the reform of environmentally harmful subsidies such as for fossil fuel. We progress this through an informal "Friends" group and the World Trade Organization (WTO), Asia-Pacific Economic Cooperation (APEC), United Nations Framework Convention on Climate Change (UNFCCC) and the Organisation for Economic Co-operation and Development (OECD).

Empower New Zealanders

The success of our transition relies on many groups taking leading roles, including central and local government, iwi and Māori, local government, the private sector and civil society.

Māori

Māori have an important leadership role in the transition to a low-emissions and climate-resilient future.

Māori are tangata whenua (the people of the land) and the partner of local and central government. Te Tiriti obliges the Government and Māori to make decisions together about our pathway in a way that balances kāwanatanga (the right for the Government to govern) with rangatiratanga (the right for Māori to make decisions for Māori).

Māori have diverse perspectives as whānau, hapū and iwi, land owners, workers, educators and community members. Māori businesses and investors are also significant contributors to the economy.

Climate change – and our transition – will have different and intersecting impacts for these groups. A number of iwi, hapū and Māori organisations are building resilience and reducing emissions, and the importance of this leadership will only increase.

We must all support these efforts and work with Māori to achieve a fair and inclusive transition.

Māori have been at the forefront of the call for sustainable management and care for the natural world, as expressed in the ethic of kaitiakitanga (guardianship). It is important to recognise the value of te ao Māori (the Māori world view) and mātauranga Māori (traditional knowledge) to the climate change response.

Te ao Māori focuses on maintaining the balance between the physical and spiritual worlds. It recognises anthropogenic global warming and biodiversity loss as reflecting practices that are incorrect, irrational and unsustainable. Te ao Māori and our obligation under Te Tiriti to protect Māori culture and people underscore the urgent need to make changes.

Central government

The Government must coordinate efforts to address climate change by factoring it into decision-making and leading by example. A number of governance arrangements and tools already support this shift.

GOVERNANCE

The transition requires shifts across the economy and actions that span several ministerial portfolios.

For greater coordination, the Climate Response Ministerial Group was established in 2020. It is chaired by the Prime Minister and made up of Ministers who hold portfolios relevant to climate change.

The Climate Response Ministerial Group meets regularly to discuss the climate change work programme and give direction on key areas, including reducing emissions and adapting to climate change.

ADMINISTERING CLIMATE POLICY

The Ministry for the Environment is the Government's primary advisor on climate change, the environment and international matters affecting the environment. It also administers the Climate Change Response Act 2002.

Although the Ministry for the Environment leads climate change policy, the response to climate change involves efforts across Aotearoa. Other government agencies contribute policy over a range of sectors, and other actors in the economy implement policy.

Since 2019, the Government has driven a whole-of-economy climate change work programme through the Climate Change Chief Executives Board. This brings together chief executives from the Ministry for the Environment, the Treasury, the Ministry of Transport, the Ministry of Business, Innovation and Employment, the Ministry for Primary Industries, the Energy Efficiency and Conservation Authority and the Ministry of Foreign Affairs and Trade.

INFORMING POLICY DECISIONS

Since 1 November 2019, government agencies have been required to undertake (and report on) a greenhouse gas emissions analysis for all policy proposals that go to Cabinet and meet certain criteria. This analysis, called a 'Climate Implications of Policy Assessment', must include an estimate of the emissions impacts for Aotearoa if the proposal is brought in. These assessments inform Cabinet's policy decisions and align them with the emissions reduction targets included in the Climate Change Response Act 2002.

LEADING BY EXAMPLE

In 2020, the *Carbon Neutral Government Programme* (CNGP) was set up to accelerate the reduction of emissions in the public sector. The Government will join businesses and communities that are leading the way.

The aim is to make a number of public organisations carbon neutral from 2025. CNGP participants should:

- measure, verify and report on their emissions annually
- set gross emissions reduction targets and longer-term reduction plans
- introduce a plan to reduce their organisation's emissions
- offset remaining gross emissions from 2025.

Local government

Local authorities (city, regional, district and unitary councils) are at the forefront of dealing with the impacts of climate change.

Local authorities have a decision-making role in the use and management of our natural resources, exercised through planning and permits. For most people, local authorities are the main government interface. They have an important role in providing public education and building support for climate change policy.

A number of councils are already addressing the impacts of climate change and the need to reduce emissions. Some are working together on initiatives to support the transition. These initiatives include strategic planning, providing infrastructure and services, and managing growth.

Regional councils are increasingly providing climate data and models that show climate change impacts at a local level. The Government is working to ensure that national policies are in place to help guide local government action.

Private sector

There is significant support from the private sector for the shift to a low-emissions economy. Organisations are increasingly taking meaningful action to reduce their emissions.

Organisations such as the Climate Leaders Coalition and Sustainable Business Council are also making strides.

The **Climate Leaders Coalition** is a CEO-led organisation launched in July 2018 with 60 signatories. It promotes business leadership and collective action on climate change. Now with over 100 signatories, it accounts for almost 60 per cent of our gross emissions and around 38 per cent of GDP, and employs over 200,000 people.

Signatories commit to measuring and publicly reporting their emissions, setting a public emissions reduction target, in line with the temperature goals of the Paris Agreement, disclosing climate risk and working with their employees and suppliers to reduce emissions.

The **Sustainable Business Council** is a membership organisation with over 115 businesses from all sectors, ambitious for a sustainable Aotearoa. Members represent more than $111 billion of collective turnover, 34 per cent of GDP and nearly 180,000 full-time jobs.

The network gives members the ability to take large-scale collective action. The Sustainable Business Council is part of the BusinessNZ network and is the National Global Network partner to the World Business Council for Sustainable Development.

Civil society

Individuals and non-governmental organisations will continue to play an important role in the transition.

It is vital that we provide ongoing, meaningful opportunities for members of the public to have their say.

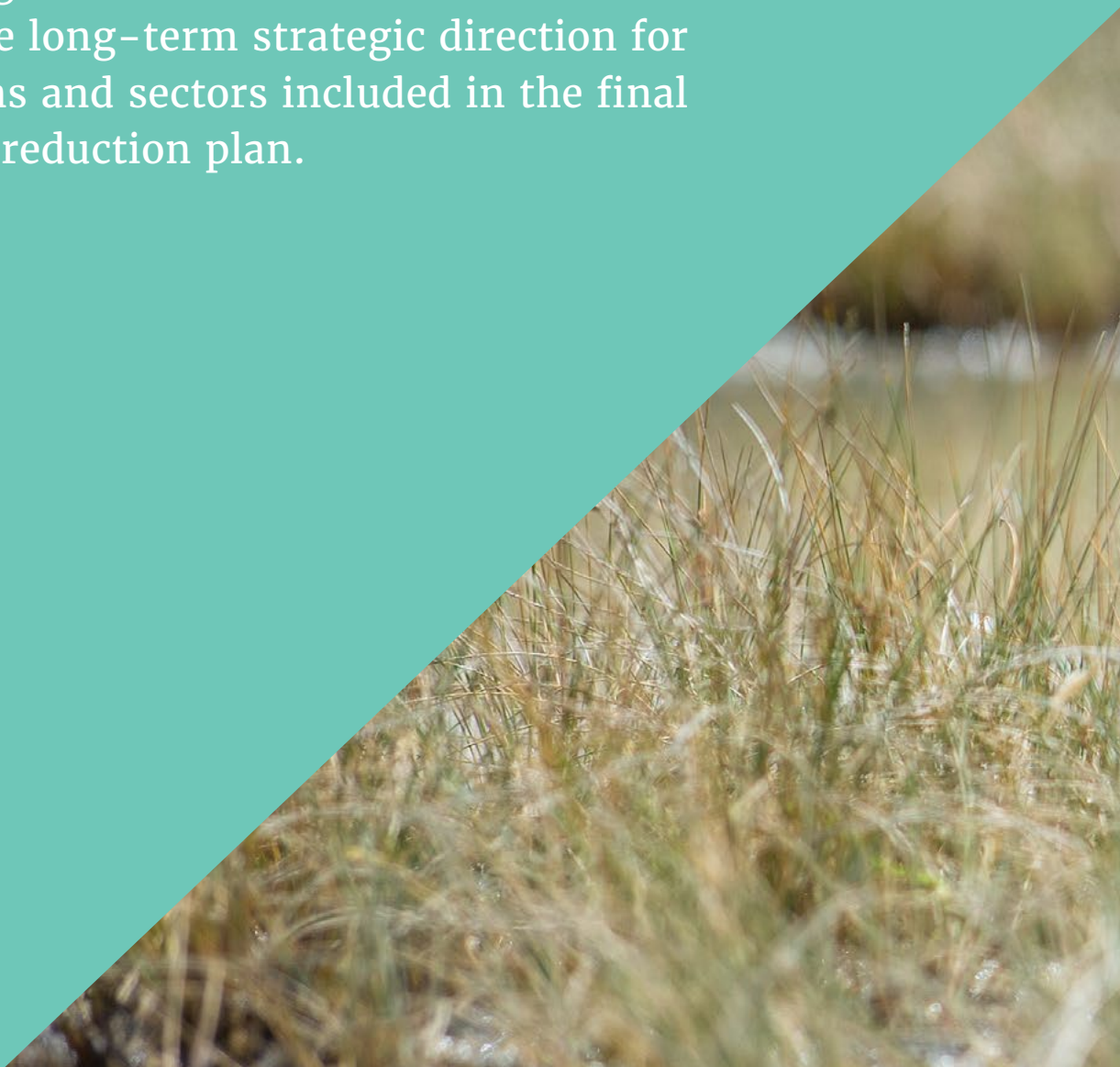
Consultation on proposals for the emissions reduction plan between 13 October and 24 November 2021 will also inform final government decisions on emissions budgets. The Government will continue to consult on new policies and measures that seek to reduce emissions and increase our carbon sinks.

Non-governmental organisations will also have a role in raising awareness of climate change, mobilising action and holding the Government to account for progress. One notable example is Generation Zero, a youth-led organisation that was instrumental in delivering the Climate Change Response (Zero Carbon) Amendment Act 2019.

Our long-term emissions reduction strategy

The emissions reduction plan is a roadmap for meeting the first emissions budget (2022–2025), staying on track to meet our next emissions budgets and reaching the 2050 target.

The next sections contextualise the detailed policies and strategies that will follow in mid-2022 and provide the long-term strategic direction for the systems and sectors included in the final emissions reduction plan.



System settings

To foster low-emissions development and avoid locking in high-emissions pathways, we must align system settings across all sectors. This will help to bring about the economy-wide transformation we need over time.

Government accountability and coordination

CONTRIBUTION TO OUR LONG-TERM VISION

Keep government institutions fit for purpose, moving the country to a low-emissions economy and leading by example.

State of play

The Government must address climate change when making decisions, lead by example and be accountable for meeting the budgets and wider reduction targets.

What we are doing now

A number of measures already provide greater accountability and coordination across the Government. For example, we have:

- made climate change a government priority and established the Climate Response Ministerial Group, chaired by the Prime Minister and supported by the Climate Change Chief Executives Board
- aligned the Government procurement system with low emissions and invested heavily in state sector decarbonisation
- established the CNGP, which aims to make a number of public organisations carbon neutral from 2025.

Long-term strategy

We will:

- make government institutions and processes fit to respond to climate change challenges, through stronger accountability and better public monitoring and reporting on progress
- continue to strengthen the regulations, to align all policies, investments and strategic direction with a low-emissions future
- provide funding and resources for climate action, and promote greater private sector investment in the transition.

Funding and finance

CONTRIBUTION TO OUR LONG-TERM VISION

Public and private funding and finance help to drive the transition to a sustainable, low-emissions, climate-resilient future.

State of play

Finance is an important catalyst for lowering emissions and increasing climate resilience. It can reduce emissions directly, as well as support others to invest in and undertake low-emission activities.

There is no single 'right' way to direct the flow of finance towards climate goals; rather we must consider a portfolio of options to achieve the outcomes we seek.

For an overview of current government work (at mid-2021), within the context of broader international trends, see *International Developments in Sustainability Reporting*.[6]

What we are doing now

Aligning public finance

The Government is considering how the public finance system can better support climate objectives, including ways to:

- prioritise spending for positive climate action through the annual government Budget process
- assess and report on what gets funded through public spending, including how well this aligns with our climate objectives
- coordinate and encourage private sector investment in climate-positive initiatives
- effectively co-invest with the private sector to accelerate climate-positive investment
- recycle proceeds from the New Zealand Emissions Trading Scheme into climate spending.

Initial work in these areas will inform the next Government Budget. It will build on a number of existing government funds and programmes that support low-emissions activities, such as the Government Investment in Decarbonising Industry Fund, the Low Emission Transport Fund and the technology demonstration funding programme.

6 Ministry of Business, Innovation and Employment. 2021. *International developments in sustainability reporting*. Wellington: Ministry of Business, Innovation and Employment.

Government agencies are also looking at novel ways to boost public investment in low-emissions activities. For example, Kāinga Ora (the agency that delivers the Government's priorities for housing and urban development) launched its Sustainability Financing Framework in 2020, to support investment in green buildings.

Mobilising private finance

The investment needs of a climate change response cannot be met by public finance alone. There are significant opportunities for private investors in expanding green finance markets. In fact, the private sector is already taking these opportunities, for example, through the recently launched Sustainable Finance Centre.

Over the past three years, the Government has taken steps to support the private sector to undertake climate-aligned investment. For example, it has:

- established New Zealand Green Investment Finance Limited (NZGIF) in 2018, to direct private sector capital into investments that reduce emissions. The latest Government Budget provided an additional $300 million for NZGIF to invest in decarbonising public transport, waste and plastics
- banned default KiwiSaver[7] funds from investing in fossil fuels
- introduced mandatory climate-related disclosures in 2021 to help investors better understand climate-change-related risks and opportunities, and support investor activity. The Financial Markets Markets Authority (the agency responsible for financial regulation) also published its disclosure framework for integrated financial products in late 2020, to support the growing market for environmental, social and governance funds
- mobilised private finance to help regional economies become more productive, resilient, inclusive, sustainable and Māori-enabling. This has been done through the Ministry of Business, Innovation and Employment's $200 million Regional Strategic Partnership Fund.[8]

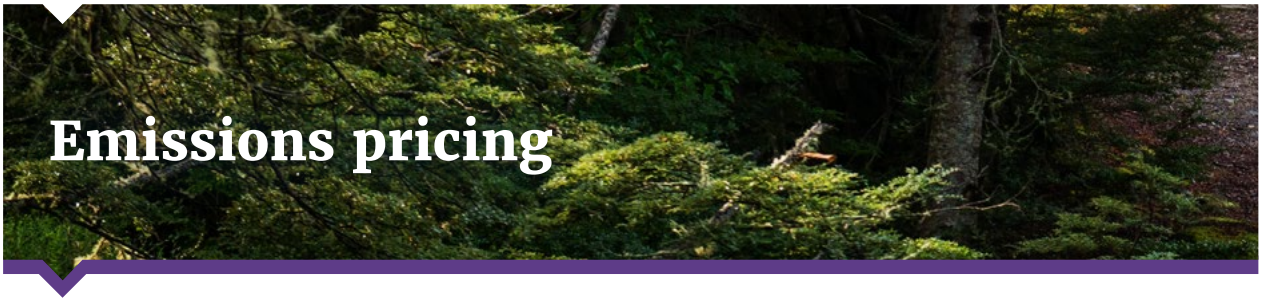
Long-term strategy

Given the breadth, scale and duration of the transition to a low-emissions economy, we will:

- ensure adequate, durable and certain public funding for climate action
- thoroughly consider climate change at every stage of decision-making for the use of public funds
- support climate-positive private investment through co-funding, overcoming information barriers and regulating where necessary.

7 KiwiSaver is a voluntary government savings scheme to help New Zealanders save for their retirement.

8 In 2020, a new $200 million strategic partnership fund was established to accelerate the development of local plans by regional economic development agencies while continuing to roll out individually funded Provincial Growth Fund projects over the next parliamentary term. This is administered by the Ministry of Business, Innovation and Employment's Kānoa – Regional Economic Development and Investment Unit (REDIU).



Emissions pricing

CONTRIBUTION TO OUR LONG-TERM VISION

Emissions and removals are priced using appropriate mechanisms. These play a key role in aligning emissions and financial flows with domestic and international targets.

By 2050, the New Zealand Emissions Trading Scheme cap will be at net zero. Only unavoidable emissions will be offset via removals or offshore mitigation.

State of play

The New Zealand Emissions Trading Scheme (NZ ETS) plays an important role in driving emissions reductions. Recent amendments ensure it continues to help us meet our domestic and international targets.

The NZ ETS has the world's broadest sector coverage. Gross emissions from all sectors, except agriculture, are priced via the NZ ETS and the Synthetic Greenhouse Gas Levy. Eligible foresters can also choose to join the NZ ETS and take responsibility for emissions and removals from their forests.

The He Waka Eke Noa partnership (see page 56) is developing a suitable mechanism to price agricultural emissions by 2025.

Key challenges

The Government sets and reduces the number of units supplied into the NZ ETS over time (not including units provided for removals).

This is done through a 'cap' set on a rolling five-year basis. Cap settings and auction price controls will be aligned with our targets. Decisions on the emissions reduction plan, and the plan for achieving the NDC will determine these NZ ETS settings.

Challenges include managing the settings to account for non-price policies and measures; and coordinating the settings with those for agricultural pricing, to ensure Aotearoa meets its domestic targets.

The significant stockpile of units held by private participants puts pressure on the NZ ETS. This is being managed over time by 'stockpile adjustments', which decrease the number of units that will be auctioned into the scheme.

The risk of emissions leakage remains a concern.[9] The current practice of free allocation to emissions-intensive and trade-exposed firms is targeted, and we are phasing out allocation rates. However, there is tension between the purpose of allocation (reducing the risk of emissions leakage) and the purpose of the NZ ETS (reducing emissions). A review of industrial allocation policy is underway.

Long-term strategy

We will:

- apply economy-wide emissions pricing through the NZ ETS and an appropriate pricing mechanism for agricultural emissions
- align pricing with the targets and ensure they work with non-pricing policies. The NZ ETS cap, auction price settings and any potential links to international carbon markets will need to be aligned with plans for achieving targets and the NDC. This will be informed by independent advice from the Climate Change Commission
- strengthen NZ ETS market governance to keep it fit for purpose and discourage market misconduct as the market evolves
- ensure NZ ETS settings are appropriately adjusted as necessary if offshore mitigation is needed to meet the NDC (eg, via the quantitative limit on the use of approved offshore mitigation)
- develop procedures for approving the use of any offshore mitigation within the NZ ETS and ensure compatibility with Paris Agreement requirements.

9 Emissions leakage describes situations where emissions pricing drives production and associated emissions overseas, leading to an increase in global emissions.

Planning and infrastructure

CONTRIBUTION TO OUR LONG-TERM VISION

Strategic planning, investing in infrastructure, and managing land and resources help us meet our targets, build climate resilience and improve people's wellbeing.

State of play

The planning system and infrastructure are not geared towards driving down greenhouse gas emissions. We are in the process of reforming the resource management and planning system.

Key challenges

Urban development decisions have not prioritised reducing emissions. Recent progress has been made in promoting well-serviced, medium and high-density, mixed-use development. However, these projects remain largely constrained by barriers such as zoning rules, a multi-decade infrastructure deficit and difficulties in coordinating land-use planning with infrastructure investment.

Despite significant demand for housing close to urban centres, the barriers have historically led to low-density and often car-dependent greenfield development in outer suburbs, resulting in poorly functioning urban form. This pattern has significantly increased transport emissions and household costs for land, transport and energy; and reduced housing variety and choice. It has also increased embodied and other emissions from construction.

Competing land use is putting pressure on the environment and economy. Environmental monitoring and reporting highlight the loss of productive land to urban sprawl. There are also mounting environmental pressures from rural and productive land use, such as the impact of farming on freshwater and soil health.

There is an urgent need for more housing. The planning system can facilitate where and how we grow towns and cities, and promote low-emissions buildings, transport and urban form.

The current system has been piecemeal, with a narrow focus with respect to mitigation. Until recently, it did not nationally address changes to planning laws and development of national direction on industrial greenhouse gas emissions.

There are tensions between environmental values, such as biodiversity and freshwater, and low-emissions activities (eg, renewable electricity generation). Not enough focus has been placed on integrating goals for multiple benefits. Larger councils have taken local action, but this should fit more closely with the actions of other councils and the Government.

The planning system has not encouraged the private sector to cut emissions and there are still barriers that affect the ability of planning and infrastructure to support the transition. We need to remove these barriers and boost incentives for low-emissions buildings and medium and high densities in mixed-use neighbourhoods close to centres or rapid transit.

What we are doing now

For the past 30 years, the Resource Management Act 1991 has largely governed the way we manage the environment. Reforms are underway and provide an opportunity to integrate emissions reduction into land-use planning and investment.

Other initiatives include:

- national direction[10] for urban development
- national direction on industrial emissions
- urban design schemes for safe, accessible, liveable neighbourhoods at a small scale
- partnerships between the Government, local government, iwi and hapū to produce long-term spatial plans for high-growth regions, with well-planned intensification and public transport-oriented projects
- Kāinga Ora: a large-scale urban regeneration programme, building energy-efficient, low-emissions buildings in neighbourhoods with sustainable transport. This is aided by the Housing Acceleration Fund for infrastructure and by work to apply a climate lens to urban planning.

Long-term strategy

We will:

- integrate climate objectives into the reformed planning legislation with the necessary levers to drive down emissions. We will increase infrastructure funding for this
- partner with Māori so that planning reforms reflect the relationship of iwi and hapū to the environment, as well as their rights and interests
- support local government climate action and develop frameworks for funding and financing
- remove barriers and encourage low-emissions urban development; this includes reducing embodied and operational and enabled use emissions, and optimising infrastructure types and locations to reduce emissions
- develop tools and gather data and evidence so that urban centres can plan for growth and infrastructure
- drive behaviour change through better public education and increased awareness
- work with the private sector to remove barriers to reducing emissions.

10 Local authorities largely implement the Resource Management Act 1991. The Government can support implementation on national, regional or local issues using tools we call national direction. These support local planning and can take the form of national policy statements, national environmental standards, national planning standards and regulations. We have a national policy statement on urban development that supports well-functioning urban environments and includes objectives for climate mitigation and adaptation.

Research, science, technology and innovation

CONTRIBUTION TO OUR LONG-TERM VISION

Research, science and innovation (RSI) provides the knowledge and insights to transform Aotearoa into a low-emissions economy that achieves economic prosperity and improved wellbeing for all.

Good access to new knowledge, technologies and processes can inform decisions and help communities, iwi, government and businesses remain resilient in a changing climate.

RSI drives the development and deployment of innovative low-emissions solutions into existing industries and sectors, accelerating our economic transition.

RSI enables the growth of new sectors, market opportunities and high-value jobs, which in turn leads to transformation and an equitable transition.

State of play

RSI provides new knowledge and technologies that mitigate the risks and realise the opportunities from reducing emissions. It partners with the private sector to enable mitigation and adaptation, which is an essential activity in transforming Aotearoa to a prosperous low-emissions future at pace. This, in conjunction with forming strategic partnerships with sectors and international organisations, can accelerate the path towards a higher-value economy delivering a healthy environment and wellbeing for all New Zealanders.

The Government invests across the system, from frontier research to business support for innovative firms bringing new solutions to market. This includes enabling Aotearoa to be an active participant globally in the development and adoption of transformative knowledge and technology. However, a lack of coordination and connectedness within the RSI system can be a barrier to fully realising this transformation.

The RSI system structurally supports decarbonisation on three fronts.

- **Developing the knowledge needed for informed decision-making:** A growing knowledge base helps the Government, iwi, communities and businesses to do things better and make informed decisions. Mātauranga Māori enhances our ability to frame problems and develop solutions, while international partnerships expand our capability frontier.
- **Using innovation to overcome barriers to sector decarbonisation by partnering with sectors and providing support to accelerate innovation:** Novel methods can solve the challenges in reducing emissions in domestic sectors. RSI can help through the exploration, piloting and translation of international technologies and practices.
- **Maximising our impact in the global green economy:** Cutting-edge science expertise and innovators give Aotearoa an advantage in designing new, low-emissions technology, building frontier firms and creating new sectors. As well as providing an economic growth opportunity, exporting domestic innovation means we can have a global impact on emissions reduction. New opportunities will create jobs that underpin a just transition.

At 1.4 per cent of GDP, current investment in RSI is insufficient to transform Aotearoa into a high-value economy that achieves net-zero emissions by 2050 and improves wellbeing.

An ongoing programme of sustained investment in areas with the potential to create competitive advantage in the global green economy is needed to achieve the economic transformation required and create a just transition for all.

What we are doing now

The Government is committed to increasing expenditure to stimulate research and development activity and developing a more connected and coordinated RSI system. This would enhance the existing activity that the RSI system contributes to emissions reduction efforts.

Existing initiatives include:

- science funding mechanisms that enable scientists to deliver an increasing volume of public good science that directly addresses our country's challenges. The Government has increased the climate signals in our flagship funds (eg, Endeavour) to encourage this growth
- contributing to an international understanding of the impacts of climate change, for example, through the Global Research Alliance on Agricultural Greenhouse Gases
- supporting fundamental advances in the technology required to transition our emitting sectors (eg, hydrogen catalysis supported by the Advanced Energy Technology Platform)
- supporting the development and application of mātauranga Māori in the science system, including through the Vision Mātauranga Capability Fund

- supporting innovative firms with a range of grants and tax incentives to take advantage of the global demand for green innovation. These firms include Mint Innovation, which uses biorefining technology to extract precious metals from e-waste, and ZeroJet, which makes electric jet propulsion systems for small boats.

The RSI system supports sectors and communities through:

- developing strategic partnerships for impact. Partnering with iwi, regulators, sector policy leads, international research organisations and frontier firms to ensure research and innovation has impact. One existing programme is the Innovative Partnerships Programme, which attracts frontier firms to conduct research and development, invest and build a sustained presence in Aotearoa and ensure the country is an attractive testbed for new technology
- deploying tools to support knowledge development, transitioning sectors and the unlocking of opportunities. This involves funding and co-investing in initiatives and infrastructure that play a fundamental role in our response to climate change. The RSI system also plays an important role in the talent pipeline for sectors, in the form of both an international talent attraction strategy and domestic talent development
- supporting the development, assessment and deployment of technology. Technology will help sectors to reduce their emissions and underpin many of the new opportunities associated with a low-emissions economy. This support involves initiatives to pilot emerging technologies and de-risk its adoption by providing confidence in the effectiveness of novel low-emissions technologies. This support ensures that Aotearoa is an active participant in the global market for technology, as both a developer and a procurer. A notable example is the Government's current investment to encourage low-emissions energy innovation and technology including the development of green hydrogen and sustainable aviation fuels.

Key challenges

Strategic investment required to enable the transformation of our economy

The transformation to a prosperous low-emissions future requires a step change in investment. This will involve the creation of new industries and radical changes to existing industries. It will also require the creation of jobs that support a just transition to a low-emissions future. Wider transformation of the economy will require a deeper evaluation of investments in science and innovation, and expanding into new frontiers.

While we have some idea of the future state of a decarbonised economy, there is still uncertainty around the source and magnitude of gains from future scientific discoveries and innovation. This will mean that, while we have to be pragmatic, we must also balance the need to move swiftly from idea to impact. The Government will need to play a coordinating and facilitating role to support the supply of innovative ideas and increase demand for low-emissions innovation.

No individual country will produce all of the science and solve all of the innovation challenges associated with the transformation to a low-emissions future. In addition to providing local capability, the RSI system must help transform transitioning sectors and communities by identifying and engaging with offshore initiatives. It must also help to translate international technology and practices, so they are suitable in our national context. This will require aligning science priorities and research with international efforts, supporting innovative firms to deliver green technology to consumers, attracting innovation talent from overseas and supporting Aotearoa to become a testbed for low-emissions technology.

Absorptive capacity for mitigation and adaption

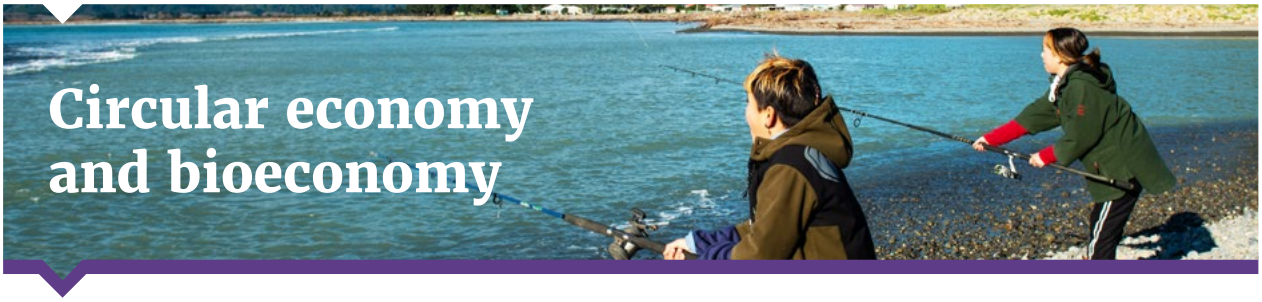
An important challenge is to ensure low-emissions innovation and technologies are available in a much shorter timeframe than is achievable by waiting for market forces to drive demand for innovation. This will require the Government to actively de-risk and support the development and translation of innovation into our national context.

To accelerate the impact from innovation, we need to coordinate and align research and development, frontier firms, investment, talent, regulation and market development. With the short timescale for the transition, and the breadth of science and innovation required, our RSI system must be adaptable, resilient, connected to the global frontier, and able to deliver and absorb innovation at pace.

Long-term strategy

To ensure our RSI system meets these challenges, the Government is supporting:

- a higher-intensity knowledge economy through strategic investments in research and science
- structural reform of the science system to deliver a more coordinated and connected research and innovation system that has clear priorities. This enables deeper integration of the RSI system with all sectors through a fluid exchange of knowledge, talent and solutions. This will enhance direct support for climate science and advanced technology
- mātauranga Māori both as a frame for understanding the challenges climate change presents and as a source of sustainable, innovative solutions for the future
- strategic international partnerships to deepen our connectedness to the global knowledge and innovation frontier associated with a prosperous low-emissions future. This includes encouraging global innovators to use Aotearoa as a testbed for pioneering low-emissions technologies and approaches, which will promote uptake of innovation by communities and firms
- the accelerated uptake of clean technology into sector. This includes strategic investment in advanced technologies with the potential to play an important role in our low-emissions future.



Circular economy and bioeconomy

CONTRIBUTION TO OUR LONG-TERM VISION

The Aotearoa economy is high-value and underpinned by circular practices, skills, innovation and the efficient use of renewable bioresources. Economic activity is designed to take place within, and to regenerate, the natural environment, create jobs and improve wellbeing for all.

State of play

Many parts of the world are shifting to a circular economy: designing out waste and pollution; keeping products and materials in use and maintaining their value; and regenerating natural systems.[11] These steps recognise the interdependency between the natural world and economic activity.

A distinctive Aotearoa approach to a circular economy is emerging. This draws from te ao Māori worldview, takes responsibility for future generations and builds in equitable and inclusive outcomes for people and communities. It also reflects our unique natural environment and the knowledge of our world-leading primary sector.

A bioeconomy provides renewable resources, like wood and other plant products, that can be used to displace fossil fuel-based products. When used sustainably, they can lead to high-value products that allow us to operate within the biogenic carbon cycle and regenerate natural systems. In this way, our bioeconomy can be seen as a component of a circular economy.

Moving to a circular economy will make an important contribution to reducing emissions. Globally, 45 per cent of emissions come from making products – everyday items like cars and clothes – and activities such as managing land.[12] Using finite resources more efficiently and in circular ways can also yield co-benefits, such as less reliance on imported materials and a more resilient economy and society.

11 Ellen MacArthur Foundation. *What is a circular economy?* Retrieved 28 October 2021.

12 Ellen MacArthur Foundation. 2019. *Completing the picture: How the circular economy tackles climate change.* Ellen MacArthur Foundation, p 13.

Key challenges and opportunities

Aotearoa currently has a largely linear economy – extracting resources, converting them into a product, and using and then discarding them. This model is highly emissions-intensive.

The move to a circular economy will involve a significant shift in how many New Zealanders value materials and products. It will also require us to move away from **entrenched patterns of production and use**.

A thriving bioeconomy will require the sustainable management of limited bioresources. Both will require **learning and change on many fronts: technological, financial, behavioural and cultural.**

These changes are also an opportunity to rethink and strengthen the economy for the long term. As well as reducing emissions, we can find new ways of doing business in regions and communities that are regenerative, are inclusive by design and enhance wellbeing for current and future generations.

Long-term strategy

Aotearoa is in the early stages of developing a circular economy with a thriving bioeconomy. To support this shift, we will:

- build on the actions underway in the waste sector, including through a new national waste strategy and updated legislation
- partner with Māori on a long-term, cross-sector strategy that supports this transition. This will yield benefits across the four wellbeings: social, economic, environmental and cultural.

Sector plans

Tailored measures will help key sectors take up opportunities, reduce emissions and increase forestry removals.

Transport

CONTRIBUTION TO OUR LONG-TERM VISION

Aotearoa will reduce transport emissions to net zero by 2050, while building a healthy, safe, equitable and accessible transport system.

State of play

Transport currently produces over 19.6 per cent of our domestic greenhouse gas emissions, and almost half of our CO_2 emissions. Transport emissions have risen more than any other emissions source, with an increase of over 84 per cent between 1990 and 2019.

Of the 43 Organisation for Economic Co-operation and Development (OECD) countries that track these emissions, Aotearoa has the fifth-highest per capita rates of CO_2 emissions from road transport.

Key challenges

Causes of these high per capita emissions include:

- heavy reliance on fossil fuels for transport. Electricity and biofuels made up less than 0.2 per cent of transport fuels in 2020. In comparison, in Sweden, renewable fuels contributed 14.7 per cent in 2015
- poor fuel economy of light vehicles entering our fleet. In 2020, light passenger vehicles (cars and SUVs) entering the fleet had an average reported emission intensity of 158 grams of CO_2 per kilometre travelled (g CO_2/km); for light commercial vehicles (vans and utilities), the figure was 219 g CO_2/km. In contrast, the figure for Europe was 122 g CO_2/km for cars and 158 g CO_2/km for light commercial vehicles registered in 2019
- reliance on road freight. Seventy per cent of freight moves by road, 16 per cent by rail and 14 per cent by coastal shipping
- urban areas characterised by sprawling low-density land-use patterns supported by motorways. This has contributed to vehicle dependence and has limited the potential for public transport and active transport use
- decades of planning and funding for travel by private car that have encouraged car use over alternatives, for example, by building extra lanes to solve traffic problems, rather than changing how we travel.

Sectors connected with the transport sector have a significant impact on transport emissions. It will be important to collaborate with these sectors, which include the planning system, housing and urban development, the energy sector and the tax system.

What we are doing now

Existing initiatives include:

- extending the light electric vehicle (EV) exemption from road user charges to 2024, which will continue to encourage New Zealanders to buy light EVs
- the Low Emissions Transport Fund (scope and funding increased from 2021). Co-funding will help industries and groups to demonstrate and adopt low-emissions transport technology, vehicles, innovation and infrastructure
- the Clean Car Discount (implementation underway), which will encourage New Zealanders to buy cleaner vehicles, by addressing the high upfront cost with incentives. In early 2022, a charge on high-emitting vehicles will apply at point of first registration in Aotearoa, to discourage purchase
- the Clean Car Standard (to be implemented in 2022), which will support a cleaner vehicle fleet by improving the efficiency of imported new and used light vehicles. It will be strengthened over time
- transitioning to a low-emissions government fleet (implemented), with the aim of cleaning up the Government's fleet by reducing its number of vehicles and choosing electric or hybrid vehicles unless operational requirements prevent this
- the zero-emissions vehicle (ZEV) mandate. The Government has created a mechanism to ensure there is a minimum percentage of ZEVs in the imported light vehicle supply. It will be used if the Clean Car Standard and Clean Car Discount do not prompt enough supply of ZEVs
- extending heavy EV exemption from road user charges, which will encourage businesses to buy heavy EVs. We are looking to amend current legislation (the Road User Charges Act 2012) to expand the duration of the exemption and bring in differential charging based on fuel or emissions
- decarbonising public transport to reduce emissions and improve air quality in towns and cities. We have committed to requiring only zero-emissions public transport buses to be purchased by 2025, and to a target of decarbonising the public transport bus fleet by 2035
- the New Zealand Rail Plan, which lays out a 10-year vision to increase investment and resilience in the rail network

- coastal shipping investment, which allocates $30–45 million from the National Land Transport Fund to identify opportunities for coastal shipping and promote a shift to this lower-emissions mode
- acceding to Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL). Aotearoa will ratify this in 2022 and apply new measures to reduce ship emissions. We have agreed to prepare a national action plan to reduce maritime emissions, and to research ways to speed the uptake of alternative low- and zero-carbon fuels for shipping
- ensuring planning helps to reduce car dependency by leveraging opportunities associated with resource management reform and the Urban Growth Agenda.

However, broader and deeper changes are needed to quickly shift the transport system to a zero-emissions pathway.

Long-term strategy

We will support central and local government, communities and businesses to work together to reduce emissions and build a healthy, safe and accessible transport system. We will also take opportunities to improve the wellbeing of New Zealanders.

Actions include:

- reducing reliance on cars and supporting people to walk, cycle and use public transport
- rapidly adopting EVs (and low-emission fuels)
- decarbonising heavy transport and freight.

Energy and industry

CONTRIBUTION TO OUR LONG-TERM VISION

Aotearoa has a highly renewable, net–zero emissions energy system. Energy is accessible and affordable and supports the wellbeing of all New Zealanders. Energy supply is secure, resilient and reliable. Energy systems support economic development and productivity growth that align with the transition to a low–emissions future.

State of play

The energy and industry sectors are essential for the economy and the lives of New Zealanders. They provide electricity to light and heat homes and workplaces, and the heat that powers manufacturing and industry. Their performance affects the cost and quality of many goods and services we use on a daily basis, and the competitiveness of businesses.

In 2019, these sectors made up 26 per cent of total gross emissions. These emissions are projected to decrease by 22 per cent from 2019 levels by 2025, 21 per cent by 2030 and 21 per cent by 2035.[13]

Key challenges

As these sectors transition over the next 30 years, we must ensure that:

- energy remains accessible and affordable to support the wellbeing of all New Zealanders
- energy supply is secure, resilient and reliable throughout the transition and beyond
- energy systems support economic development and productivity growth, in line with the transition.

Components to manage through this transition include:

- managing the phase-out of fossil fuels, including by:
  - ensuring reliable energy supply for industry as well as residential and other consumers
  - supporting the phase-down of domestic fossil fuel production following the ending of new permits for offshore oil and gas exploration
  - ensuring a just transition for affected businesses, employees and communities
- encouraging investment in new renewable electricity generation and infrastructure, and large-scale energy storage
- assisting New Zealanders to engage in the energy system through household and local technology solutions, including efficient management of energy resources
- increasing the availability and use of low-emissions fuels
- supporting the pathway for transition for other sectors, such as transport, and building and construction.

13 The stationary energy emissions projection is from the Ministry of Business, Innovation and Employment's (MBIE's) updated Electricity Demand and Generation Scenarios (EDGS). Since the release of the EDGS in 2019, MBIE has included the impact of the COVID-19 pandemic in the 2021 projection. This will be published in *Energy in New Zealand 2021* (forthcoming). The non-energy emissions projection for industrial processes and product use is provided by the Ministry for the Environment.

What we are doing now

We are well positioned to tackle emissions in the energy and industry sectors because of the high level of renewable electricity, but we must do more.

We must move to a more renewable electricity system as we head towards the 2050 target. Accelerating the rollout of renewable electricity generation will be a significant factor in replacing fossil fuels in other sectors.

The Government has an aspirational target of 100 per cent renewable electricity by 2030. This will be reviewed in 2025. It will allow time for more information on solutions to the 'dry year' challenge to be identified through the New Zealand Battery Project.

The NZ ETS is an important tool to help reduce emissions in these sectors. A rising carbon price discourages fossil fuel use and encourages investment in energy efficiency and fuel-switching.

Other measures aim to reduce emissions in areas that are not responsive to emissions pricing, to unlock co-benefits or to address the distributional impacts of the transition.

The Government's Renewable Energy Strategy Work Programme has guided work to decarbonise energy and industry, including by:

- assisting industry to decarbonise through the Energy Efficiency and Conservation Authority's business support programmes, and the $70 million Government Investment in Decarbonising Industry Fund to drive the uptake of energy efficiency and fuel-switching
- developing national direction to phase out coal boilers for low–medium temperature process heat by 2037
- accelerating renewable electricity by:
  - investigating options to manage 'dry year' risk and move towards 100 per cent renewable electricity through the New Zealand Battery Project
  - reviewing planning instruments to speed development of renewable electricity
- encouraging the uptake of energy efficiency through product regulations and programmes, such as Warmer Kiwi Homes
- developing A Vision for Hydrogen in New Zealand to outline potential uses of hydrogen, funding demonstration projects and building international partnerships.

Long-term strategy

We will continue to:

- accelerate renewable electricity and prepare the electricity system for future needs and technologies, including large-scale energy storage
- improve the uptake of energy efficiency and demand-side management measures
- help businesses and industry to decarbonise
- encourage development and use of low-emissions energy sources, such as bioenergy and hydrogen
- manage the phase-down of fossil fuels, including in electricity generation, manufacturing and industry, and in buildings.

Building and construction

CONTRIBUTION TO OUR LONG-TERM VISION

Building-related emissions are significantly reduced and, in doing so, we see other benefits from better homes and buildings, such as improved health, economic and social outcomes.

The sector is making an important contribution to the net-zero target and to higher living standards for New Zealanders.

State of play

Building-related emissions can be quantified in two ways: the 'consumption' approach and the 'production' approach.

Under the production approach,[14] in 2018, buildings generated 4 per cent of the nation's long-lived emissions, mainly from fossil fuels.

Under the consumption approach,[15] the sector contributes about 15 per cent of Aotearoa's long-lived emissions. Across a building's lifespan, about half of the emissions are generated by the energy used to heat, cool and otherwise run buildings (known as operational emissions). The other half relate to building materials and processes used across a building's lifespan for construction, renovation, deconstruction, transport of materials and waste (known as embodied emissions). Under this approach, most building-related emissions are accounted for in the energy, industry, waste and transport sectors.

We are using the 'consumption' approach as it provides opportunities to reduce emissions across the whole economy.

What we are doing now

Transformational change of both the system and sector is required to lower emissions and improve building quality. We must also help the sector to address other challenges, such as workforce and supply shortages. In Aotearoa, housing affordability is an issue that actions to reduce emissions must address.

The **Building for Climate Change** programme is the main platform to reduce emissions from the sector. Regulations under consideration include:

- mandatory reporting and caps to improve the operational efficiency of all new buildings, which could include caps for carbon emissions, fossil fuel and water use
- mandatory reporting and caps to reduce whole-of-life embodied carbon emissions in all new buildings
- changes to the New Zealand Building Code to strengthen energy efficiency requirements, enhancing the Building Code changes consulted on earlier in 2021.

14 A production approach takes account of emissions at the point where they are 'produced', that is, when human activity leads to the emissions being released into the environment. For example, emissions from coal used to generate electricity for a building are accounted for at the power station (in the energy sector). In contrast, emissions from coal used directly in a boiler in a building are accounted for at the building (in the building and construction sector). This is the international standard for greenhouse gas reporting.

15 A consumption approach takes account of emissions at the point where they are 'consumed' and includes all the emissions from a product or service across its entire supply chain. For example, this would include all the emissions from extracting materials for use in a building product, through to their manufacture and end use in a building. This approach includes any related transport, energy, waste or other emissions produced from the point of extraction to their final use.

The proposed regulatory changes would be complemented by measures that increase consumer demand for and industry supply of lower-emissions and more climate-resilient buildings.

These could include initiatives that build on existing low-emission actions across the sector. They could also encourage early adopters to start reducing their emissions now, before potential regulatory change occurs.

We are using government property portfolios and procurement roles to reduce building-related emissions and send a signal to the rest of the sector. For example, Kāinga Ora – Homes and Communities has pilot projects to show how to build lower-emissions, quality housing developments at scale.

Certain government office buildings must meet third-party energy efficiency requirements. All agencies must use the Sustainable Construction Procurement guidelines when procuring construction projects.

We are partnering with industry through the Construction Sector Accord to jointly address long-standing challenges, including climate change. The Accord's three-year transformation plan is changing behaviour to lift overall performance, make a safer, better-skilled and more productive industry and share good practice. This collaboration will help us to make an equitable transition.

We are focused on reducing emissions in a way that realises co-benefits for New Zealanders, where possible. Buildings that are better insulated, drier and warmer require less energy to operate and contribute to improved health, economic and social outcomes for the families and whānau living in them. Medium- and higher-density buildings, supported by planning and transport networks, can reduce building-related emissions while connecting communities and improving social and individual wellbeing.

Long-term strategy

We will further implement policies and actions through programmes such as Building for Climate Change, and continue to leverage the Government's property and portfolio roles. This will:

- make buildings more energy efficient to run
- reduce whole-of-life carbon emissions from buildings
- produce resilient buildings, suitable for the changing climate where they are built
- reduce emissions in other parts of the economy, including energy and industry, waste and transport.

We will continue to work with the sector and Tiriti partners to continue an equitable transition for workers, including creating jobs that contribute to high-quality, low-emissions construction.

Waste

CONTRIBUTION TO OUR LONG-TERM VISION

Aotearoa has a circular economy that keeps materials in use for as long as possible and has reduced waste emissions in line with the 2030 and 2050 targets for biogenic methane.

State of play

Waste sector emissions (of which 92 per cent are methane) account for around 4 per cent of gross greenhouse gas emissions; 81 per cent are from solid waste disposed to landfill.

Key challenges

Per person, Aotearoa is among the highest disposers of municipal waste in the OECD. This is due to a relatively high amount and broad geographic spread of waste from our urban areas and primary industries, combined with the abundance and low cost of landfills.

Transitioning to a circular economy will require a major shift in consumption behaviours and development of enabling policies, resource recovery systems and infrastructure.

Significant data gaps exist for some waste types, including from construction and demolition, and farm fills.

What we are doing now

Existing initiatives include:

- the National Environmental Standards for Air Quality (introduced in 2004), which manage discharges to air of greenhouse gases (mainly methane) from large landfills, requiring these sites to collect and destroy methane emissions
- the Waste Minimisation Act 2008, which aims to reduce the environmental harm caused by waste and to provide economic, social and cultural benefits
- the waste disposal levy (since 2009), which raises revenue for promoting and achieving waste minimisation. It increases the cost of waste disposal to recognise the costs of waste to the environment, society and the economy
- the Waste Minimisation Fund (established 2010), which supports projects that may reduce emissions from waste
- the NZ ETS (since 2013), which prices emissions from municipal waste disposal facilities.

Collectively, these measures have reduced waste emissions over the past 15 years, but we need to take further action. We have recently:

- adopted a waste work programme to accelerate the transition to a low-emissions circular economy. From 2021, it will build the foundations for a transformed waste system. This includes a long-term waste strategy and a waste infrastructure plan, new waste legislation and improved waste data systems, in line with emissions budgets
- increased the rate of the waste disposal levy and expanded it to cover more classes of landfills. This will further incentivise and increase funds available for waste minimisation, including resource recovery infrastructure
- announced development of regulated product stewardship schemes for six priority products: plastic packaging, tyres, electrical and electronic products, agrichemicals and their containers, refrigerants and farm plastics. These schemes shift responsibility for a product's lifecycle from communities and councils to producers and consumers. This will reduce emissions and support our wider circular economy objectives.

Long-term strategy

We will:

- apply circular economy principles, refresh the waste strategy and update legislation
- substantially improve our systems, enable behaviour change at many levels and increase investment in infrastructure through measures that:
  - reduce the waste produced
  - reduce the organic waste sent to landfill by diverting it to beneficial uses
  - enhance the capture of landfill gas.

To contribute to the biogenic methane targets, we are also working on future proposals to limit or ban some or all organic materials disposed to landfill, by 2030.

Fluorinated gases

CONTRIBUTION TO OUR LONG-TERM VISION

Aotearoa has net-zero emissions from refrigerants, while enabling the electrification of heating and access to heating and cooling for all New Zealanders.

State of play

Fluorinated gases (F-gases) made up about 2.5 per cent of total emissions in 2019.

F-gases are mainly used as refrigerants for heating and cooling, and are dominated by HFCs (92 per cent of F-gas emissions). They are potent greenhouse gases, with global warming potential (GWP) hundreds or thousands of times greater than CO_2. HFC refrigerants contribute a hugely disproportionate amount to global emissions.

While HFCs are a small proportion of our total emissions, new technology could have a significant impact, including an estimated 35 per cent reduction by 2035.

Key challenges

Refrigerants are vital for everyday refrigeration, heating and cooling systems. We will need to coordinate our move to sustainable heating and cooling technologies with other factors, including energy efficiency, health and safety, and cold-chain stability.

What we are doing now

Existing initiatives include:

- ratifying the Kigali Amendment to the Montreal Protocol; 2020 was the first year of the phase-down of HFCs imported to Aotearoa in bulk under this amendment
- making imports of F-gases subject to the NZ ETS. Also, goods and vehicles containing HFCs or perfluorocarbons (PFCs) are subject to a levy. This is linked to the price of carbon and is updated annually to reflect NZ ETS costs
- a regulated product stewardship scheme for refrigerants, which we are co-designing with industry. Producers and sellers may be required to join an accredited scheme. Manufacturers, importers, retailers and users would have to take responsibility for the emissions from refrigerants. The Ministry for the Environment will consult on the regulations in 2022.

Together, these measures are expected to result in a 31 per cent reduction in HFC emissions by 2035.

Long-term strategy

Emissions reductions from F-gases are led by our commitments to the Kigali Amendment, which requires the phase-down of bulk HFC imports.

We must promote good industry practice and go further than our commitments under the Kigali Amendment by:

- implementing regulated product stewardship for refrigerants
- considering further import controls.

Agriculture

CONTRIBUTION TO OUR LONG-TERM VISION

Agricultural emissions are reduced, in line with the biogenic methane targets for 2030 and 2050.

The sector supports the health of our land, water and living systems, and produces nutritious food and high-quality natural fibres for domestic and international markets.

State of play

Aotearoa has a unique emissions profile for a developed country. Emissions from agriculture make up 48 per cent of gross greenhouse gas emissions, the largest of any sector in the New Zealand Greenhouse Gas Inventory. This reflects the economic importance of the primary sector.

Of these agricultural emissions, over 77 per cent are biogenic methane emitted from livestock. We have adopted a split-gas emissions reduction target to reflect the different warming potential of short-lived gases, such as methane, compared with long-lived gases, such as CO_2 and nitrous oxide.

Total agricultural emissions increased by 17 per cent between 1990 and 2005, and have been relatively stable since then. Improvements in on-farm efficiency and productivity have lessened the impact of increasing emissions, even as overall production has grown. Greenhouse gas efficiency in farming has increased about 1 per cent per annum over the past 25–30 years.

If farmers had not improved efficiency, emissions would have increased by an estimated 30–40 per cent since 1990.

Key challenges

The Paris Agreement recognises the importance of safeguarding food security and ending hunger. We must reduce agricultural emissions in a way that does not threaten food production and builds resilience to the impacts of climate change.

At present, there are limited options to reduce biological emissions without significantly affecting production. These include on-farm practice change and land-use change. Implementing existing mitigation practices requires behaviour change and upskilling farmers and growers at a national scale. Further investment in mitigation technologies, such as methane inhibitors, vaccines and genetics, is needed to unlock more ambitious emissions reductions.

The primary sector also provides a livelihood for many rural and regional communities, as well as iwi and Māori who have significant investments in pastoral farming. A significant challenge will be to mitigate the potential economic and social impacts of the climate transition on farmers, businesses, iwi and Māori, and rural communities.

What we are doing now

The He Waka Eke Noa – Primary Sector Climate Action Partnership is a partnership between the Government, the primary sector and Māori to measure, manage and reduce agricultural emissions. The Climate Change Response Act 2002 sets a series of milestones for this partnership, including implementing farm-level pricing for agricultural emissions from 2025. The partnership also has pre-2025 milestones to help farmers know their total annual emissions, and to have written farm plans to measure, manage and reduce these.

Agricultural greenhouse gas research. The Government and industry have invested in research and development to improve productivity and reduce emissions. Domestic research is supported through a range of programmes including the New Zealand Agricultural Greenhouse Gas Research Centre, the Sustainable Food and Fibres Future fund, the Sustainable Land Management and Climate Change research programme, the Greenhouse Gas Inventory Research Fund and the Pastoral Greenhouse Gas Research Consortium.

Aotearoa champions international research on agricultural emissions through the Global Research Alliance on Agricultural Greenhouse Gases (GRA). The GRA has 65 member countries from all regions, involves over 3,000 scientists, and partners with global organisations to find shared solutions to reduce agricultural emissions.

Through the GRA, Aotearoa helps developing regions to build capacity across many countries to measure and manage agricultural emissions. This initiative is one way we show global leadership in areas where we have specific expertise.

Long-term strategy

We will reduce agricultural emissions in line with our climate targets. This will require widespread changes in farm practice, new technologies and continued investment. Such changes will involve:

- pricing agricultural emissions to encourage farmers to reduce emissions
- investing in research and development to accelerate the availability of new mitigation practices and technologies
- expanding extension and advisory services to help farmers gain the knowledge and resources they need to measure, manage and reduce their emissions
- enabling the transition to low-emissions land use.

We will take a holistic approach to the changes underway across the primary sector to reduce our impact on the climate and protect our waterways and biodiversity. We will maintain our reputation as one of the world's most sustainable providers of high-value fibres and nutritious food, while supporting the global shift to more sustainable production.

Forestry and nature-based solutions

CONTRIBUTION TO OUR LONG-TERM VISION

Forests and forest products contribute to a more productive, sustainable, inclusive and resilient Aotearoa.

Forests offset gross emissions and provide products and bioenergy that displace emissions-intensive alternatives.

We have leading, sustainable forest practices and create innovative, sought-after forest products.

Native forests are at the heart of work to preserve and promote indigenous biodiversity; they also provide a long-term carbon sink. Māori are empowered as kaitiaki (guardians) and lead innovation that meets their aspirations.

Our goal is to empower Māori and all key stakeholders with the skills, knowledge and resources to ensure we maximise opportunities to grow the role that forests and wood products play in our nation's future.

State of play

Forests cover about one-third of Aotearoa. This includes over 8 million hectares of indigenous forest, of which around 2.5 million hectares is on private land and around 2.1 million hectares is exotic plantation forest. In 2019, forested land alone offset almost 27 per cent of gross emissions.

Forests play a critical role in meeting our climate targets and provide a renewable resource to support our transition to a low-emissions economy. Forestry is an important economic sector and source of employment, and diverse forests enhance soil conservation, water quality and climate resilience. Our native forests are central to maintaining and enhancing the native biodiversity of Aotearoa, and are of significant cultural and recreational value. They also have an important role in providing a long-term carbon sink.

For Māori, the land represents whakapapa (genealogy) and heritage, and Māori have significant interests in forests and forestry as kaitiaki, land and forest owners, and workers. Māori are well positioned to contribute to and lead developments in forestry for production, conservation and cultural purposes. The Government has a commitment to partner with and protect Māori and iwi knowledge, interests, values and taonga under Te Tiriti o Waitangi.

We have recently entered a period of net afforestation, after nearly two decades of low levels of afforestation and net deforestation. Government policy, including the NZ ETS and One Billion Trees Programme,[16] has been a major driver of this increase.

We need a considerable area of new forest to meet our climate change targets, even with significant reductions in gross emissions: the Climate Change Commission's projections would see more than 1.2 million hectares of new forests (exotic and native) from 2022 to 2050.

A significant area of lower-productivity pastoral land has been identified as being suitable for new afforestation. This includes about 1.5 million hectares that could be suitable for planting production forestry and 1.2 million hectares for new permanent forest, due to steep, erosion-prone land.

What we are doing now

The NZ ETS is an important driver of afforestation, alongside environmental drivers, log prices and the availability of affordable land. Reforms have made it easier to participate in the NZ ETS and improved incentives for afforestation, while recent changes to price controls (for 2022 to 2026) provide for a new carbon price pathway to incentivise reductions in gross emissions.

Other initiatives support the contribution of forests and forest products to a range of outcomes, including our climate targets. In particular:

- afforestation grants and incentives, such as those under the One Billion Trees Programme, have helped drive afforestation and have wider benefits such as erosion control and Māori development
- the Government is setting up a planning and advisory service within Te Uru Rākau | New Zealand Forest Service to support delivery on priorities for forests and forest products
- a forestry and wood processing industry transformation plan is being developed and will investigate how to enhance forestry's contribution to the bioeconomy. It will consider options to provide a more consistent supply of wood fibre and to attract investment in the production of low-emissions wood products and biofuels
- the Aotearoa New Zealand Biodiversity Strategy aims to promote and protect both biodiversity and the carbon stored in indigenous vegetation
- the Fit for a Better World – Accelerating Our Economic Potential roadmap sets out actions to transform the forestry sector and refocus our tree-planting partnerships.

16 The One Billion Trees Programme, established in 2018, is a 10-year programme that aims to increase tree planting across Aotearoa. This is being achieved by replanting existing forests, establishing new forests through grants, joint ventures and partnerships, and making the recent changes to the NZ ETS to more strongly encourage afforestation. Funding for grants and joint ventures, which kickstarted the programme, has closed to new applications and the broader programme is continuing to keep us on track to meet the goal of establishing one billion trees by 2028.

With rising carbon prices,[17] a priority is to ensure NZ ETS settings support the sequestration needed to meet our targets without delaying emissions reductions in other sectors.

We must also encourage the right amount, type and location of forests, to deliver the sequestration we need to meet our targets and support wider socio-economic and environmental outcomes.

Long-term strategy

We will:

- balance forest sequestration with emissions reductions from other sectors, for a cost-effective, equitable and timely transition
- provide overarching strategic direction and policies that ensure forests and forest products support a range of outcomes, including biodiversity and sequestration
- work in close partnership with Māori and key stakeholders, including territorial authorities and land owners, to develop and implement forestry policies.

17 Under NZ ETS price control settings from 2022, the auction 'price floor' is at $30 and the cost containment reserve trigger is at a price of $70.

Equitable transition

Our low-emissions pathway includes steps to partner with Māori, protect the economy, communities and livelihoods, and share the benefits among all New Zealanders.

CONTRIBUTION TO OUR LONG-TERM VISION

We have successfully moved to a low-emissions and climate-resilient Aotearoa in a way that is fair and equitable and upholds Te Tiriti o Waitangi.

State of play

The Climate Change Response Act 2002 provides the framework for managing the transition through a system of targets, emissions budgets and emissions reduction plans.

Emissions reduction plans must include a strategy to mitigate the effects of the transition on employees and employers, regions, iwi and other Māori, and wider communities, including funding for any mitigation action.

Committing to an equitable transition aligns with other government objectives, including building closer partnerships with Māori, future-proofing the economy and protecting livelihoods. We are identifying where our plan will present the greatest challenges, and how we can assist communities, households and businesses to prepare for and manage the impacts of the transition. At the same time, we must take the opportunities that the transition brings, share the benefits and strengthen the social licence for the transition.

Long-term strategy

We will:

- meet each of the emissions budgets through a coherent strategic package that comprises a mutually supportive and balanced combination of emissions pricing, well-targeted regulation, tailored sector policies and direct investment
- enable an equitable transition for Māori by upholding the principles of Te Tiriti, actively partnering with Māori on national strategies, and embedding Māori values and knowledge into our climate response. We will also support tangata whenua to decide on and implement their own actions
- continue to build strong partnerships with businesses, unions, workers, local government and civil society to take action on climate change
- help firms and households reduce their emissions footprint, promote new business and job opportunities, and support workers, households and communities through the transition.

Next steps

We will publish the first three emissions budgets in May 2022.

The remaining sections of the emissions reduction plan will also be published in May 2022. These will provide detailed information about the steps that Aotearoa will take to reduce emissions and increase its carbon sinks in the first budget period (2022–2025).

Consultation is underway to inform these policies, which will put us on the path to meet the next budgets and our long-term emissions goals.

Glossary

2050 target	Set in the Climate Change Response Act 2002, this target requires: ▸ emissions of all greenhouse gases (except biogenic methane) to be net zero by 2050 ▸ emissions of biogenic methane emissions to be 24–47 per cent below 2017 levels by 2050 (and 10 per cent by 2030).
abatement	The reduction or removal of greenhouse gas emissions.
adaptation	Actions to respond to the effects of a changing climate.
anthropogenic	Originating in human activity.
Aotearoa	A Māori name for New Zealand.
bioenergy	Energy produced by living organisms.
biofuel	Fuel produced from organic material – often plants or animal waste.
biogenic methane	All methane emissions produced from the agriculture and waste sectors (as reported in the New Zealand Greenhouse Gas Inventory).
carbon sequestration or carbon sink	Any reservoir that absorbs more carbon than it releases, thereby lowering the overall concentration of carbon dioxide in the atmosphere. Examples include forests, vegetation, peatland and the ocean.
circular economy	An economic system based on designing out waste and pollution, reusing products and materials, and regenerating natural systems.
Climate Change Commission	A Crown entity that gives independent, expert advice to the Government on climate change matters and monitors progress towards the Government's mitigation and adaptation goals.
climate resilience	The capacity of social, economic and environmental systems to cope with a hazardous event, effect, trend or disturbance caused by climate change, including by responding or reorganising in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.
CO_2	Carbon dioxide.
CO_2-e	Carbon dioxide equivalent. Used to describe and compare different types of greenhouse gases, by comparing their warming potential to that of CO_2.

decarbonise	Reduce greenhouse gas emissions, for example, through the use of low-emissions power sources and electrification.
embodied emissions	Emissions associated with the production of materials and construction processes throughout the lifespan of a building, including during construction, renovation, ongoing use and demolition.
emissions	Greenhouse gases released into the atmosphere, where they trap heat or radiation.
emissions budget	The cumulative amount of greenhouse gases that can be emitted in New Zealand over five-year periods prescribed in the Climate Change Response Act 2002. Three successive emissions budgets must be in place at any given time.
emissions reduction plan	A plan that sets out the policies and strategies to meet emissions budgets by reducing emissions and increasing removals. A new emissions reduction plan must be in place before the beginning of each emissions budget period.
EV	Electric vehicle.
F-gases	Fluorinated gases; mainly used as refrigerants for heating and cooling.
fossil fuels	Natural fuels formed in the geological past from the remains of living organisms, for example, coal and natural gas. When used as fuel, these emit greenhouse gases.
greenhouse gases	Atmospheric gases that trap or absorb heat and contribute to climate change. The gases covered by the Climate Change Response Act 2002 are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).
gross emissions	New Zealand's total emissions from agriculture, energy, industrial processes and product use (IPPU) and waste sectors as reported in the reports required under the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and the Paris Agreement. While Tokelau's gross emissions are also included in the New Zealand Greenhouse Gas Inventory, they are not included for the purposes of emissions budgets or emissions reduction plans.
hapū	Kinship group, clan, subtribe.
hydrofluorocarbons (HFCs)	A category of human-made greenhouse gases often used in refrigeration, air conditioning and other processes.
iwi	Tribe, large group descended from a common ancestor.

kaitiaki or kaitiakitanga	Guardian or guardianship, stewardship, for example, of natural resources.
linear economy	The predominant economic system globally, following the model of 'take-make-use-dispose.
low-emissions, low-carbon	An economic and social system that has moved away from the use of fossil fuels and adopted low-emissions energy sources and processes, and consequently produces minimal greenhouse gas emissions.
mātauranga Māori	Māori knowledge systems and worldviews, including traditional concepts.
mitigation	Human actions to reduce emissions by sources or enhance removals by sinks of greenhouse gases. Examples of reducing emissions by sources include walking instead of driving, or replacing a coal boiler with a renewable electric-powered one. Examples of enhancing removals by sinks include growing new trees to absorb carbon, or industrial carbon capture and storage activities.
Mt CO_2-e	Metric tonnes of carbon dioxide equivalent.
NDC	Nationally determined contribution. Each Party to the Paris Agreement must define its contribution to the long-term temperature goals set out in the agreement, in the form of an NDC.
net emissions	Net emissions are made up of gross emissions combined with emissions and removals from the land use, land use change and forestry (LULUCF) sector, as reported in the reports required under the United Nations Framework Convention on Climate Change, the Kyoto Protocol, and the Paris Agreement. For the purposes of emissions budgets and emissions reduction plans, this excludes Tokelau's emissions.
net zero	A target of completely negating the greenhouse gas emissions produced by human activity. This can be done by balancing emissions and removals or by eliminating the production of emissions in the first place.
NZ ETS	New Zealand Emissions Trading Scheme.
offshore mitigation	Emissions reductions and removals that occur outside New Zealand, or overseas-based incentives to reduce or remove emissions (for example, by the pricing of emissions through participation in an overseas emissions trading scheme).
operational emissions	Emissions from operating a building.

organic waste	Wastes containing carbon compounds that are capable of being readily biologically degraded, including by natural processes, such as paper, food residuals, wood wastes, garden and, plant wastes, but not inorganic materials such as metals and glass or plastic. These, and excluding hazardous substances. Organic wastes can be decomposed by microorganisms into methane, carbon dioxide, nitrous oxide, and simple organic molecules (plastic contains carbon compounds and is theoretically organic in nature, but generally is not readily biodegradable).
Paris Agreement	A legally binding international treaty on climate change mitigation, adaptation and finance, adopted by 196 Parties in Paris and signed in 2016. One of the goals of the Paris Agreement is "holding the increase in global average temperature to 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels".
perfluorocarbons (PFCs)	These are organofluorine compounds containing only carbon and fluorine. Some of them are potent greenhouse gases.
product stewardship	A scheme in which a producer, importer, retailer or consumer takes responsibility for reducing a product's environmental impact.
tangata whenua	The people of the land, local indigenous people. Māori are tangata whenua.
taonga	Treasure, anything prized – applied to anything considered to be of value, including socially or culturally valuable objects, resources, phenomenon, ideas and techniques.
Te ao Māori	The Māori world.
Te Tiriti o Waitangi or Te Tiriti	The Treaty of Waitangi. **Note:** While these terms are used interchangeably, we acknowledge that the English version and te reo Māori translation are separate documents and differ in a number of respects.
transition	The shift to a low-emissions, sustainable economy and way of life.
whānau	Extended family, family group.
Zero Carbon Framework	Introduced by amendments to the Climate Change Response Act 2002 in 2019, this is a legislative framework to enable the transition to a low-emissions and climate-resilient Aotearoa. This includes a statutory 2050 target, provision for emissions budgets and emissions reduction plans, together with national climate change risks assessments and national adaptation plans.

Ministry for the
Environment
Manatū Mō Te Taiao

Te Kāwanatanga o Aotearoa
New Zealand Government