



**Te Kāwanatanga o Aotearoa**  
New Zealand Government

December 2022

# **Aotearoa New Zealand's Methane Emissions Reduction Action Plan**



## Contents

<b>I. Overview .....</b>	<b>3</b>
<b>II. Background .....</b>	<b>5</b>
About methane emissions .....	6
Aotearoa New Zealand’s methane emissions profile .....	6
Aotearoa New Zealand’s emissions reduction targets .....	7
<b>III. Aotearoa New Zealand is taking international and domestic action to reduce methane emissions.....</b>	<b>8</b>
International actions.....	8
Domestic actions.....	12
Aotearoa New Zealand’s Emissions Reduction Plan .....	12
Pricing methane emissions .....	12
Agriculture .....	12
Waste.....	13
Energy and industry .....	13
<b>IV. Aotearoa New Zealand’s forward work on methane emissions ...</b>	<b>18</b>
<b>V. Endnotes .....</b>	<b>19</b>

## I. Overview

This document constitutes Aotearoa New Zealand's Methane Emissions Reduction Action Plan (Methane Plan) as at December 2022, as part of our participation in the Global Methane Pledge.

The Global Methane Pledge is aimed at contributing to limiting global warming to 1.5°C. The initiative has set a global, collective goal to reduce methane (CH<sub>4</sub>) emissions by at least 30 percent from 2020 levels by 2030.

Aotearoa New Zealand has placed limiting global warming to 1.5°C at the heart of our climate change response. Our contribution to the Global Methane Pledge's global goal is a combination of international and domestic action aimed at identifying, measuring, and reducing methane emissions:

- **International action:** Aotearoa New Zealand is committed to working with others to support greater and faster global emissions reductions. Key international climate change initiatives to reduce methane emissions that Aotearoa New Zealand is involved in are outlined in Section III, Table 1 (pages 9-11).
- **Domestic action:** Aotearoa New Zealand has set targets to reduce emissions. By 2030 we aim to reduce biogenic emissions by 10 percent below 2017 levels and reduce net emissions by 50 percent below gross 2005 levels. By 2050 we aim to reduce biogenic methane emissions by between 24 to 47 percent below 2017 levels and achieve net zero emissions of all other greenhouse gases. The actions Aotearoa New Zealand is taking to achieve these targets are outlined in Section III, Table 2 (pages 14-17).

In addition to these actions, the following sections of this document set out: the significance of methane emissions; our country's methane emissions profile; and our forward work on methane emissions.

A summary of this document – Aotearoa New Zealand's Methane Plan – is provided on pages 4-5.

# Aotearoa New Zealand's Methane Emissions Reduction Action Plan

This document summarises Aotearoa New Zealand's Methane Plan, communicated for the Global Methane Pledge. Participants in the Pledge have agreed to take voluntary actions to contribute to the collective effort towards a global 30 percent reduction in methane emissions by 2030.

## Why reducing global methane emissions matters to Aotearoa New Zealand:

Limiting global warming to 1.5°C is at the heart of Aotearoa New Zealand's climate change response. The Intergovernmental Panel on Climate Change advises that rapid, steep methane reductions, alongside bringing global carbon dioxide emissions to net zero by 2050, are needed to meet this temperature goal.

Methane emissions last for a short time in the atmosphere relative to long-lived greenhouse gases, but make the world warmer than it would be otherwise over that period.

## Aotearoa New Zealand is taking action on methane emissions internationally and domestically

### International Action:

We play an active role in international fora on methane-related issues and through participation in initiatives, including:

Partnering with Environmental Defense Fund on the **MethaneSAT** space mission – to quantify and map global methane emissions

**MethaneSAT** could catalyse methane emissions reductions from oil and gas infrastructure globally by at least 45 percent by 2025, as well as from agricultural sources

Contributing and funding the **Global Research Alliance on Agricultural Greenhouse Gases** to support countries and research into agricultural mitigation

Contributing to the **Climate and Clean Air Coalition** to reduce methane emissions, including from livestock systems

Supporting international processes to improve the quantification of methane emissions in **Greenhouse Gas Inventories**

Contributing to the **Policy Dialogue on Accelerating Transition to Sustainable Agriculture** to encourage global best practice and investment in sustainable agriculture

Active participation and contributions to the OECD, including the **Trade and Agriculture Directorate**, to progress work on agricultural and other issues

Membership of the **Agricultural Innovation Mission for Climate** towards agricultural climate action and innovation

### How are methane emissions priced?

Energy	✓	NZ ETS	Industry	✓	NZ ETS
Waste	✓	NZ ETS (partial coverage)	Agriculture	✗	To be priced from 2025

## How we will work with others to support greater and faster global emissions reductions:

Aotearoa New Zealand is taking action on methane emissions, through:

- partnerships and international initiatives.
- a Nationally Determined Contribution under the Paris Agreement to reduce net emissions by 50 percent below gross 2005 levels by 2030.
- setting domestic policies, emissions reduction budgets and targets:
  - » **2030:** we will reduce biogenic methane emissions by 10 percent below 2017 levels (equivalent to a reduction of 0.13 MtCH<sub>4</sub>)
  - » **2050:** we will reduce biogenic methane emissions by between 24 to 47 percent below 2017 levels (equivalent to a reduction of between 0.32 and 0.63 MtCH<sub>4</sub>) and achieve net zero emissions of all other greenhouse gases (including non-biogenic methane to 0 MtCH<sub>4</sub>).

### Domestic Action:

We are taking specific actions to target methane emissions relevant to key sectors:

#### Agriculture

- Price agricultural emissions by 1 January 2025
- Establish a new Centre for Climate Action on Agricultural Emissions to drive a step change in mitigation technology innovation and uptake on farms
- Support indigenous knowledge informed approaches to emissions reductions from agriculture
- Support clear and effective regulatory pathways for agricultural mitigation tools
- Develop further climate-focused extension and advisory services
- Support indigenous knowledge-based programmes to support needs and aspirations of Māori entities
- Build the evidence base for regenerative agriculture
- Reduce the emissions of our largest farmer state-owned enterprise
- Develop food and fibre science and indigenous knowledge-informed accelerators

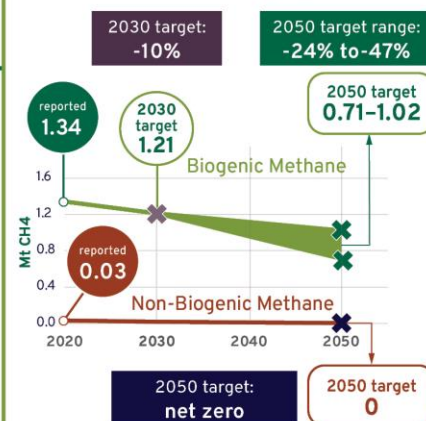
#### Energy and Industry

- Privately-led methane emissions reduction efforts due to the dispersed and comparatively small nature of these emissions in the energy and industry sectors
- Update information on historical coal mines to improve the accuracy of our reporting on fugitive methane emissions, including in our Greenhouse Gas Inventory

#### Waste

- Encourage behaviour to prevent waste from households
- Enable businesses to reduce food waste
- Support participation in improved kerbside collections
- Improve household kerbside collection of food and garden waste
- Invest in organic waste processing and resource recovery infrastructure
- Require the separation of organic waste
- Support the building and construction sector to minimise waste through research and improved capability
- Invest in sorting and processing infrastructure for construction and demolition waste
- Enable the separation of construction and demolition materials
- Investigate banning organic waste from landfill by 2030
- Regulations to require landfill gas capture at municipal landfills
- Feasibility studies to determine the need for additional landfill gas capture requirements
- Develop a national waste licensing scheme
- Improve information on greenhouse gas emissions from waste disposal
- Specific air quality regulations for the control of landfill methane
- Raise revenue via the Waste Disposal Levy for the promotion and achievement of waste minimisation
- Direct Waste Minimisation Funds to reduce emissions from waste

### Methane emissions at target year in MtCH<sub>4</sub>



### Our emissions profile:

Methane emissions come from two sources:



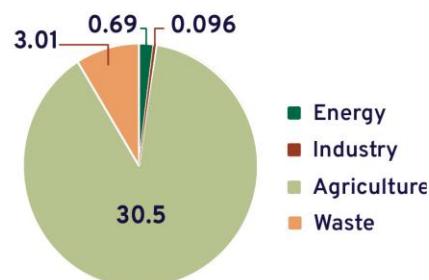
**Biogenic**  
from agriculture  
and waste



**Non-biogenic**  
from the energy and  
industry sectors

In 2020, Aotearoa New Zealand's gross methane emissions contributed 43.5 percent of our country's total greenhouse gas emissions, or 34.3 MtCO<sub>2</sub>e.

The chart below shows the breakdown of our methane emissions by sector in MtCO<sub>2</sub>e:



While biogenic methane represents a significant proportion of our total emissions, non-biogenic methane does not.

## II. Background

### About methane emissions

Methane is a short-lived greenhouse gas. This means that it degrades in the atmosphere over decades. In comparison, long-lived greenhouse gases like carbon dioxide (CO<sub>2</sub>) have a much longer lifetime in the atmosphere. Despite methane emissions remaining in the atmosphere for less time before degrading, the warming effect over that period is greater than carbon dioxide<sup>i</sup>.

Methane emissions come from two different types of sources: non-biogenic and biogenic. Biogenic methane is produced from biological sources such as plants, animals, and waste. Non-biogenic methane, on the other hand, emanates from fossil fuels and other anthropogenic sources in sectors except agriculture and waste. It can return geological carbon to the atmosphere that has typically been stored underground for millions of years. Example sources include coal mining, natural gas leakage, and methanol production from natural gas.

Like all greenhouse gases, methane emissions make the world warmer than it would be otherwise. The Intergovernmental Panel on Climate Change advises that rapid, steep methane reductions, alongside bringing global carbon dioxide emissions to net zero by 2050, are needed to limit global warming to 1.5°C<sup>ii</sup>. Reducing methane emissions across all sectors of economies is important. Substantial reductions are currently achievable with available technology particularly in the energy and industry sectors.

### Aotearoa New Zealand's methane emissions profile

In 2020, Aotearoa New Zealand's gross methane emissions contributed 43.5 percent of our country's total greenhouse gas emissions, or 34.3 MtCO<sub>2</sub>-e<sup>iii</sup>. The agriculture, waste, energy, and industry sectors' contributions made up 89, 9, 2 and 0.3 percent of this total respectively (see Figure 1).

Figure 1 breakdown of our methane emissions and non-methane emissions by sector

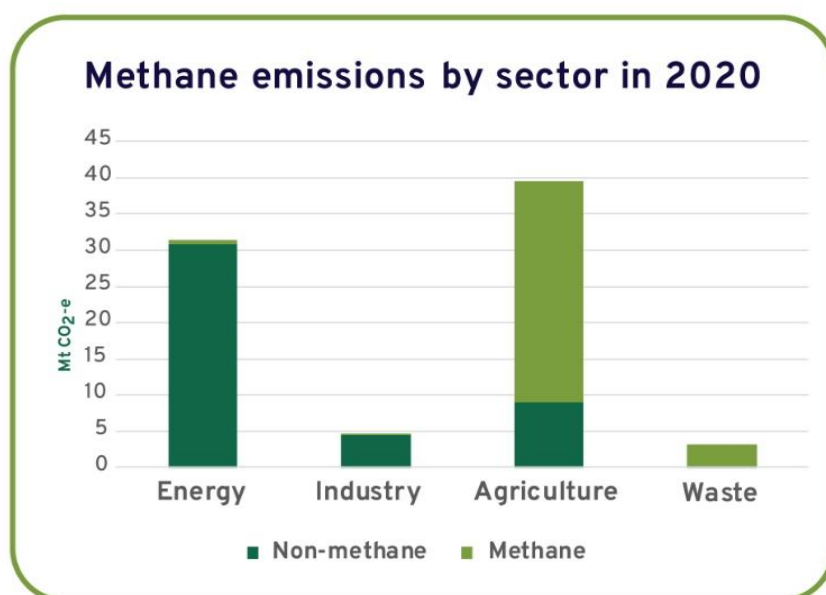


Figure 1 shows the proportion that methane emissions comprise of each sector of the economy. We note there are uncertainties in relation to emissions data. Further information on these uncertainties, and the reasons for their relative contributions to different sectoral emissions estimates, are outlined in Aotearoa New Zealand's Greenhouse Gas Inventory 1990-2020 at <https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2020/>.

## Aotearoa New Zealand's emissions reduction targets

Aotearoa New Zealand's methane emissions reduction objectives sit within a wider climate change framework. To drive our contribution to the global effort of limiting warming to 1.5°C, Aotearoa New Zealand has adopted a series of emissions reduction targets.

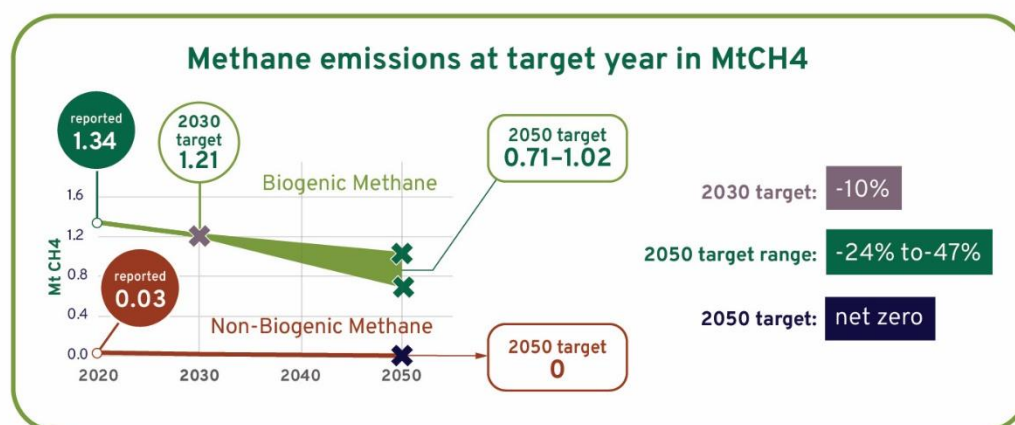
Aotearoa New Zealand has set an economy-wide Nationally Determined Contribution (NDC) under the Paris Agreement. Our NDC covers all sectors and all greenhouse gases, including methane. The headline target of our first NDC is to reduce net emissions by 50 percent below our gross 2005 levels by 2030.

We have also legislated a 2050 emissions reduction target. We have set specific targets to reduce biogenic methane emissions by between 24 to 47 percent by 2050, and by 10 percent by 2030, below 2017 levels. Our overall target is to achieve net zero emissions of all other greenhouse gases by 2050, including non-biogenic methane.

The separate components of our 2050 target acknowledge: our emissions profile; a targeted way to manage change across every sector of our economy; and the different warming effects that greenhouse gases have on the atmosphere. In comparison, our NDC covers all sectors and all gases, in accordance with our responsibility as a developed country to continue to undertake economy-wide absolute emission reduction targets.

Figure 2 shows Aotearoa New Zealand's methane emissions in 2020 and permitted under our domestic targets. In 2020, Aotearoa New Zealand emitted 1.34 MtCH<sub>4</sub> of biogenic methane (1.22 MtCH<sub>4</sub> in the agriculture sector, 0.12 MtCH<sub>4</sub> in the waste sector) and 0.03 MtCH<sub>4</sub> of non-biogenic methane (0.03 MtCH<sub>4</sub> in the energy sector, 0.004 MtCH<sub>4</sub> in the industry sector). Our domestic targets aim to reduce our biogenic methane emissions to 1.21 MtCH<sub>4</sub> by 2030 (equivalent to a reduction of 0.13 MtCH<sub>4</sub>), and to between 0.71 and 1.02 MtCH<sub>4</sub> by 2050 (equivalent to a reduction of between 0.32 and 0.63 MtCH<sub>4</sub>). Non-biogenic methane will be reduced to zero MtCH<sub>4</sub> by 2050.

Figure 2 methane emissions in 2020 and permitted at domestic target year



We have established a system of emissions budgets to meet our 2050 target. The New Zealand Government published the first three emissions budgets (2022-2025, 2026-2030, 2031-2035) in May 2022<sup>iv</sup>.

### **III. Aotearoa New Zealand is taking international and domestic action to reduce methane emissions**

Aotearoa New Zealand contributes to the Global Methane Pledge through both our international and domestic actions. Internationally, we engage to accelerate global emissions reductions by investing in identification of emissions, low-emissions research, development and innovation, and supporting efforts to enhance measurement, reporting and verification processes, including through partnering on a Methane Satellite. Domestically, we are taking concrete action to reduce our own methane emissions in accordance with our domestic biogenic methane reduction target. Recognising our expertise in biogenic methane from agriculture, many of our policies and actions (domestic and international) are focused on the agriculture sector.

#### **International actions**

Climate change is a collective challenge that can only be addressed by collective action. Aotearoa New Zealand is committed to working with others to support greater and faster global emissions reductions. Cooperation is key to improving the quantification of methane emissions and encouraging new innovations. It is also key to growing access to existing technologies, which can achieve the majority of the methane emissions reductions needed to meet the Global Methane Pledge's goal to cut emissions by at least 30 percent from 2020 levels by 2030<sup>iii</sup>.

The table on the following page provides information on some key international climate change initiatives and actions Aotearoa New Zealand is involved in to reduce methane emissions.

In addition to the initiatives and actions noted in the table, Aotearoa New Zealand plays an active role in a number of other international fora on issues that impact on global methane emissions. For example, we engage on agricultural mitigation in the United Nations Framework Convention on Climate Change. We also advocate for global reform of environmentally harmful subsidies, including both fossil fuel and agricultural subsidies, across a variety of fora. The continuation of these subsidies contribute to adverse effects on the environment and on sustainable development. This includes slowing the transition to more sustainable and emissions-efficient agriculture production systems globally.



Sector	Focus area	Actions
Cross-cutting	Methane Satellite	<p><b>Aotearoa New Zealand’s Ministry of Business, Innovation and Employment has partnered with the Environmental Defense Fund (EDF), a US NGO, on the MethaneSAT space mission.</b> MethaneSAT is a state-of-the-art satellite that will quantify and map global methane emissions from oil and gas infrastructure and agriculture.</p> <p>MethaneSAT will have the unique capability to measure methane over both large areas – a 200 kilometre view path – down to 100 metre targets. An innovative data platform will automatically process and provide a continuous stream of actionable data on the volume of methane escaping into the atmosphere in days.</p> <p>Data from the MethaneSAT satellite will improve global data sets on methane emissions over time. This will support the technical and policy work of existing international methane emissions reduction initiatives. The data will be free and open to all. The EDF intends for the data to catalyse a reduction in methane emissions from oil and gas infrastructure by at least 45 percent by 2025.</p> <p>Aotearoa New Zealand’s NZ\$26 million investment in the MethaneSAT will enable the mission to capture data from agricultural methane sources through an atmospheric science programme led by New Zealand researchers. It will also support the development and hosting of the Mission Operations Control Centre (MOCC) for MethaneSAT, initially at Rocket Lab, and later the University of Auckland’s Te Pūnaha Ātea-Auckland Space Institute.</p> <p>More detail can be found at <a href="https://www.mbie.govt.nz/science-and-technology/space/space-related-opportunities-in-new-zealand/methanesat-mission/">https://www.mbie.govt.nz/science-and-technology/space/space-related-opportunities-in-new-zealand/methanesat-mission/</a></p>
Cross-cutting	Greenhouse Gas Inventory support	<p><b>Aotearoa New Zealand is committed to international processes to improve the quantification of methane emissions in other countries.</b> We have participated in a number of reviews of Greenhouse Gas Inventories of other countries. We have also assisted developing countries with emissions quantification through the Global Research Alliance on Agricultural Greenhouse Gases.</p> <p>This builds on Aotearoa New Zealand’s commitment to continual improvement of our Greenhouse Gas Inventory. We have invested significantly into refining the accuracy of emissions factors, methods and data use in our Inventory. For example, 95 percent of Aotearoa New Zealand’s agriculture emissions are estimated on the basis of using research conducted in Aotearoa New Zealand.</p>

<p><b>Agriculture</b></p>	<p><b>Policy Dialogue on Accelerating Transition to Sustainable Agriculture through redirecting public policies and support and scaling innovation</b></p>	<p><b>Aotearoa New Zealand exchanges information and experiences on agricultural emissions reduction policies, as a part of our engagement in this Policy Dialogue.</b> The Dialogue provides a valuable forum to advance international momentum on removing harmful trade and production distorting agricultural subsidies toward transitioning to more sustainable agriculture sectors.</p> <p>The Dialogue recognises that there is no one-size-fits-all approach to sustainable agriculture policy, but global cooperation is valuable in fostering innovation and continually improving what constitutes 'best practice'. It also provides a platform to showcase opportunities for agricultural emissions reductions, including by highlighting new initiatives and mechanisms to encourage global investment in sustainable agriculture.</p> <p>Through the Dialogue we share our experience of removing trade and production distorting support. We have refocused this support toward research and development and agricultural extension services. This approach has empowered positive change at the farm level in Aotearoa New Zealand, incentivising innovation that benefits sustainability without compromising economic efficiency.</p>
<p><b>Agriculture</b></p>	<p><b>Global Research Alliance on Agricultural Greenhouse Gases</b></p>	<p><b>The Global Research Alliance on Agricultural Greenhouse Gases (GRA) is a core part of Aotearoa New Zealand's contribution to support the reduction of methane emissions.</b> Aotearoa New Zealand was a founding member of the GRA in 2009 and hosts its Secretariat. We have championed international research into measuring and reducing agricultural emissions, including methane. The GRA's success now extends throughout 65 member countries, and over 3000 scientists are involved in its activities.</p> <p>Aotearoa New Zealand is a Co-Chair of the GRA Livestock Research Group, which focuses on developing joint research collaborations across its member countries to reduce the emissions intensity of livestock production. The project has enabled participating countries to identify and model mitigation options that will significantly reduce enteric methane emissions intensity while improving the efficiency of livestock production. In 2020, the New Zealand Government committed NZ\$50 million to support this work. This funding will be allocated across three workstreams, supporting:</p> <ul style="list-style-type: none"> <li>• the continued hosting of the Secretariat and the Special Representative, as well as the Aotearoa New Zealand Co-Chair of the Livestock Research Group;</li> <li>• mitigation research, including GRA Flagships, and developing members to participate in collaborative research such as low emissions livestock development; and</li> <li>• capability programmes, including a programme of activities with the Association of Southeast Asian Nations and Southern and Eastern African States to improve measurement of agricultural greenhouse gases such as methane.</li> </ul> <p>More detail can be found at <a href="https://globalresearchalliance.org/">https://globalresearchalliance.org/</a></p>

<p><b>Agriculture</b></p>	<p><b>Organisation for Economic Co-operation and Development</b></p>	<p><b>Aotearoa New Zealand is an active member of the Organisation for Economic Co-operation and Development (OECD) and of the Trade and Agriculture Directorate (TAD).</b> The TAD work programme covers agriculture and the environment, agriculture and trade, as well as evaluation and monitoring of members’ agricultural policies.</p> <p>We regularly contribute to the OECD’s work on agricultural issues, through sharing research or expertise in meetings. For example, in 2022 our Minister of Agriculture co-chaired the OECD Agriculture Ministerial, covering topics to drive agricultural climate ambition (including on methane reductions) from OECD member countries.</p>
<p><b>Agriculture</b></p>	<p><b>Agricultural Innovation Mission for Climate</b></p>	<p>Aotearoa New Zealand joined the Agricultural Innovation Mission for Climate in 2021, recognising its potential to drive increased political commitments and mobilise existing commitments toward effective agricultural climate action. Many of the research projects Aotearoa New Zealand is involved in through the GRA have been adopted by the Agricultural Innovation Mission for Climate as innovation sprints, including:</p> <ul style="list-style-type: none"> <li>• the Green Cattle Initiative: Addressing Enteric Methane Emissions, which aims to identify and develop socially responsible mitigation options that are scientifically sound and commercially feasible.</li> <li>• soil organic carbon sequestration opportunities in Latin America and the Caribbean, which aim to contribute to the design of land use and management with high potential for social organic carbon sequestration, as well as build capacity for the quantification of monitoring soil organic carbon stocks.</li> <li>• satellite monitoring of available biomass in pastoral livestock systems, which aims to lower the cost of estimating the quantity and quality of biomass in pastoral livestock systems.</li> </ul> <p>More information on the Agricultural Innovation Mission for Climate can be found at <a href="https://www.aimforclimate.org/">https://www.aimforclimate.org/</a></p>
<p><b>Agriculture</b></p>	<p><b>Climate and Clean Air Coalition</b></p>	<p><b>Aotearoa New Zealand contributes to the Climate and Clean Air Coalition (CCAC) to reduce methane emissions from livestock systems.</b> We previously Co-Chaired the Agriculture Initiative of the CCAC and stepped down in 2019. Our involvement continues, including in developing the vision statement for the CCAC to extend its remit to 2030.</p> <p>The CCAC, Food and Agriculture Organisation and the New Zealand Government funded the project, “Reducing enteric methane for improving food security and livelihoods”. The project aimed to support low- and middle-income countries to identify system-specific technologies and interventions to increase livestock productivity, food security and reduce enteric methane emissions per unit of product. More detail is available at <a href="https://www.fao.org/3/ca4334en/ca4334en.pdf">https://www.fao.org/3/ca4334en/ca4334en.pdf</a>.</p> <p>Further information on the CCAC more generally can be found at <a href="https://www.ccacoalition.org/en">https://www.ccacoalition.org/en</a></p>

## Domestic actions

### Aotearoa New Zealand's Emissions Reduction Plan

Aotearoa New Zealand published our first Emissions Reduction Plan in May 2022. It sets out comprehensive policies and strategies toward achieving our long-term emissions reduction targets. Our Emissions Reduction Plan covers all sectors of our economy, including those that emit methane. The Plan is available online at <https://environment.govt.nz/publications/aotearoa-new-zealands-first-emissions-reduction-plan/>.

### Pricing methane emissions

The New Zealand Emissions Trading Scheme (NZ ETS) creates a price signal on domestic emissions, and covers all greenhouse gases and almost all sectors of our economy.

**Methane associated with non-biogenic fuel consumption and production, and biogenic emissions sources from our municipal landfills, face an emissions price and are effectively geared toward achieving net zero emissions.** This is because the NZ ETS is primarily aimed at contributing to Aotearoa New Zealand's NDC and net zero 2050 target.

Two thirds of the emissions from our waste sector do not face NZ ETS obligations, including unmanaged landfill sites and wastewater treatment plants. The administrative costs of managing compliance for these activities outweigh the environmental benefits of their inclusion in the scheme.

**Emissions from agriculture, including methane, will be priced by 2025.** Emissions from our agriculture sector are not included in the NZ ETS<sup>v</sup>, however Aotearoa New Zealand has legislated through our Climate Change Response Act that a pricing system will be established. The Government will make final decisions on the design of a farm level pricing system in early 2023. Further details of this work are available on page 14.

### Agriculture

Agricultural emissions make up 50 percent of Aotearoa New Zealand's gross emissions, with methane accounting for around 77 percent of our agricultural emissions (see Figure 1). Our agriculture sector will therefore be key to achieving our legislated biogenic methane reduction targets.

Aotearoa New Zealand is a leader in sustainable agricultural innovation and, by addressing our own agricultural emissions, we can help forge solutions for the rest of the world and accelerate global methane reductions. Over the last 30 years, Aotearoa New Zealand's emissions intensity in the agriculture sector has dropped by 1 percent per year.

Aotearoa New Zealand eliminated trade and production distorting agriculture subsidies in the late 1980s, which alongside investments in research and development, contributed towards emissions reductions across the sector. Aotearoa New Zealand considers that agricultural emissions reductions can, and should be, achieved without trade and production distorting subsidies. These subsidies account for almost US\$540 billion of Government spending a year globally, and there is a growing evidence base that suggests this expenditure is harmful to people and the planet<sup>vi</sup>.

## Waste

In 2020, the waste sector accounted for 4.1 percent of Aotearoa New Zealand's total gross emissions, 92 percent of which were from biogenic methane<sup>vii</sup>. These emissions were largely generated by the decomposition of organic waste (such as food, garden, wood and paper waste) in landfill<sup>viii</sup>. We recognise that taking steps to reduce, recycle and recover greater volumes of organic waste – and improve services and infrastructure – will create opportunities. These steps will support the shift to a circular economy, create new employment and business opportunities, improve the ability to dispose of waste responsibly, and generate cost savings for households and businesses.

Aotearoa New Zealand's aim is for the waste sector to contribute towards the achievement of our 2030 and 2050 targets for biogenic methane reductions. The Government is also looking to achieve a 40 percent reduction in waste biogenic methane emissions by 2035 (relative to 2017 levels). Additionally, as mentioned earlier, some of the waste sector is effectively geared toward achieving net zero emissions given the inclusion of municipal landfills in the NZ ETS.

## Energy and industry

Methane emissions from the energy and industry sectors made up 2.3 percent of Aotearoa New Zealand's total methane emissions in 2020. Energy emissions (2 percent) occur in the coal, oil and gas, and geothermal sectors, and industry emissions (0.3 percent) occur during the production of methanol<sup>ix</sup>.

In the global context, methane emissions from energy and industry often represent a significant proportion of countries' total emissions. A reduction of these emissions can be relatively straightforward depending on countries' circumstances. However, in Aotearoa New Zealand there are not the same opportunities to reduce methane emissions from the energy and industry sectors. This is because of our small amount of methane emissions in total, and the dispersion of these emissions sources across different parts of these sectors. Attempts to further reduce these emissions at this time would require highly targeted interventions which are generally less cost effective than alternative broader emissions reduction activities.

Due to the small methane emissions reduction potential in the energy and industry sectors, the energy and industry component of our first Emissions Reduction Plan focuses on targeting carbon dioxide emissions. This reflects the fact that 97.1 percent of Aotearoa New Zealand's energy and industry emissions come from carbon dioxide.

The dispersed and comparatively small nature of methane emissions in the energy and industry sectors mean reduction efforts are privately led in Aotearoa New Zealand. For instance, Energy Resources Aotearoa has formed an energy accord, across the upstream oil and gas industry, in which one of the focus areas is to "invest significantly in low-emissions upstream technologies including energy efficiency; low-emission fuels; and flaring and venting reduction"<sup>x</sup>. Alongside these useful steps by industry, Aotearoa New Zealand is currently updating information on historical coal mines to improve the accuracy of our reporting on fugitive methane emissions. This work is intended to be completed in time for Aotearoa New Zealand's 2023 Greenhouse Gas Inventory submission.

Sector	Focus area	Actions
Agriculture	Pricing agricultural methane by 2025	<p><b>Our Climate Change Response Act requires that agricultural emissions are priced by 1 January 2025</b> – the New Zealand Government will make final decisions on the design of a farm-level emissions pricing system in early 2023. This system will help incentivise adoption of low-emissions practices and technology.</p> <p>The Government established the He Waka Eke Noa – Primary Sector Climate Action Partnership in 2020 to support the transition to farm-level emissions pricing from 2025. This includes equipping farmers to measure, manage and reduce on-farm emissions and adapt to climate change.</p> <p><b>Additional legislated milestones to help prepare producers for the introduction of emissions pricing –</b></p> <ul style="list-style-type: none"> <li>• All farms have a documented annual total of on-farm greenhouse gas emissions by 31 December 2022;</li> <li>• A pilot of a farm-level accounting and reporting system has been completed by 1 January 2024 across a range of farm types;</li> <li>• All farms have a written plan in place to measure and manage their greenhouse gas emissions by 1 January 2025.</li> </ul>
Agriculture	Accelerate new mitigations	<p><b>Establish a new Centre for Climate Action on Agricultural Emissions to drive accelerated research, development and commercialisation of emissions reductions technologies</b> – the Government has committed to a significant increase in investment of NZ\$338.7 million to establish the new Centre, which will strengthen the role of research and development to get mitigations to producers sooner. The Government is also working to accelerate the uptake of new mitigations options by reducing barriers for mainstreaming on farm.</p> <p><b>Support indigenous knowledge informed approaches to emissions reductions from agriculture</b> – the Government is working with Māori (Aotearoa New Zealand’s indigenous peoples) to enable indigenous knowledge informed (mātauranga Māori-based) approaches that will support Māori entities to define Māori priorities for climate change mitigation.</p> <p><b>Support clear and effective regulatory pathways for agricultural mitigation tools</b> – to make it easier for producers to adopt new mitigation technologies, the Government will strengthen and streamline the greenhouse gas mitigation regulatory regime.</p>

<p><b>Agriculture</b></p>	<p><b>Support producers to make changes</b></p>	<p><b>Develop further climate-focused extension and advisory services</b> – the Government will introduce multichannel information campaigns to upskill producers, extension programmes, use the Action Network approach to develop farmers’ confidence to turn knowledge into on-farm action, and grow the pipeline of trusted industry advisers who have a strong understanding of emissions reduction practices and practical experience in working farm settings.</p> <p><b>Support indigenous knowledge-based programmes to support needs and aspirations of whenua Māori entities</b> – Māori indigenous knowledge-based programmes are needed to support Māori landowner and farmers transition to a low-emissions future and to ensure the intergenerational wellbeing and prosperity.</p> <p><b>Improve rural digital connectivity</b> – to improve farm efficiency and access to information and online tools to reduce emissions and support uptake of new emissions mitigations technologies.</p>
<p><b>Agriculture</b></p>	<p><b>Transition to lower-emissions land use and systems</b></p>	<p><b>Build the evidence base for regenerative agriculture</b> – a Technical Advisory Group for regenerative agriculture was established by Aotearoa New Zealand’s Ministry for Primary Industries in September 2020. Its purpose is to help establish an evidence base for regenerative farming and horticultural practices.</p> <p><b>Reduce the emissions of our largest farmer, Pāmu</b> – the Government will work with Aotearoa New Zealand’s largest farmer, the state-owned enterprise Landcorp Farming Limited (trading as Pāmu), to investigate options to further reduce its gross emissions beyond current plans.</p> <p><b>Develop food and fibre science and indigenous knowledge informed accelerators</b> – develop science and indigenous knowledge (mātauranga Māori-based) informed research and development plans to accelerate R&amp;D to grow and transform the food and fibre sector, while promoting lower-emissions land use and food production.</p>
<p><b>Waste</b></p>	<p><b>Enable households and businesses to reduce organic waste</b></p>	<p><b>Encourage behaviour to prevent waste at home</b> – support national programmes to help households prevent and reduce food waste and, where possible, garden waste.</p> <p><b>Enable businesses to reduce food waste</b> – develop programmes to drive business practices that prevent food waste, and continue to investigate the production and consumption of food waste as a symptom of the failure of wider food systems.</p>

		<b>Support participation in improved kerbside collections</b> – provide support and education to households for better use of kerbside organic collections.
<b>Waste</b>	<b>National Environmental Standard for Air Quality</b>	<b>Specific regulations for the control of landfill methane</b> – implemented by local and regional councils, requires landfill sites with a lifetime design capacity of greater than one million tonnes of refuse to collect and destroy methane emissions.
<b>Waste</b>	<b>Increase the amount of organic waste diverted from landfill</b>	<p><b>Improve household kerbside collection of food and garden waste</b> – introduce enabling regulation to standardise and improve kerbside collections, and engage with local government to support implementation of kerbside food scraps collections.</p> <p><b>Invest in organic waste processing and resource recovery infrastructure</b> – prioritise improvements to our resource recovery infrastructure and emissions reductions through a new Waste Strategy, and invest in processing/recovery of food and garden waste, and paper and cardboard recovery/recycling via the Waste Minimisation Fund.</p> <p><b>Require the separation of organic waste</b> – investigate whether to require businesses to separate food waste for collection to require paper, cardboard and/or glass to be collected separately, and explore whether regulations should be introduced to require the separation of organic materials for recovery.</p>
<b>Waste</b>	<b>Reduce and divert construction and demolition waste to beneficial uses</b>	<p><b>Support the building and construction sector to minimise waste through research and improved capability</b> – scope measures to accelerate the reduction and diversion of construction and demolition waste.</p> <p><b>Invest in sorting and processing infrastructure for construction and demolition waste</b> – prioritise improvements to our resource recovery infrastructure and emissions reductions through a new Waste Strategy and Waste Infrastructure Plan. Increase investment sorting and progressing infrastructure for construction and demolition waste, targeting wood waste, via the Waste Minimisation Fund.</p> <p><b>Enable the separation of construction and demolition materials</b> – explore enabling powers to allow for future changes as part of the development of the new waste legislation.</p>



<b>Waste</b>	<b>Explore bans or limits to divert more organic waste from landfill</b>	<b>Investigate banning organic waste from landfill by 2030</b> – modelling suggests that it may be necessary to limit or ban disposal of all or some types of organic materials to landfill by 2030. This action is subject to consultation, further analysis and viable alternatives being in place.
<b>Waste</b>	<b>Increase the capture of gas from landfills</b>	<p><b>Regulations will require landfill gas capture at municipal landfills</b> – require all municipal (Class 1)<sup>xi</sup> landfills to have Landfill Gas capture systems by 31 December 2026.</p> <p><b>Feasibility studies will determine the need for additional landfill gas capture requirements</b> – phase the introduction of additional landfill gas capture requirements to avoid unintended impacts across the landfill system. Undertake feasibility studies to determine whether additional landfill gas capture requirements or organic material bans should be implemented at non-municipal (Class 2 to 5) landfills.</p>
<b>Waste</b>	<b>Improve waste data and prioritise a national waste licensing scheme</b>	<p><b>Develop a national waste licensing scheme</b> – explore proposals through new waste legislation to enable the collection of data, and engage with local government and waste service providers to ensure obligations and data reporting requirements of a national scheme are feasible.</p> <p><b>Improve information on greenhouse gas emissions from waste disposal</b> – undertake a national data collection and reporting programme to improve our understanding of the emissions from waste, and begin the annual publication of national waste statistics (likely to begin from 31 December 2023).</p>
<b>Waste</b>	<b>Waste disposal levy</b>	<p><b>Raising revenue for the promotion and achievement of waste minimisation</b> – the levy encourages organisations and individuals to take responsibility for their waste generation and to find more effective ways to reduce, reuse, recycle or reprocess waste.</p> <p><b>Improve information on waste production and handling</b> – collect better data about the waste being produced and disposed, and explore ways that waste can be better managed.</p> <p><b>Expand waste levy to cover additional landfill types</b> – initially, the waste levy applied only to municipal landfills. In July 2022, it expanded to include construction and demolition (Class 2) landfills. By July 2023, the levy will also apply to managed and controlled (Class 3 and 4) fills<sup>xii</sup>.</p>

## **IV. Aotearoa New Zealand's forward work on methane emissions**

Over time Aotearoa New Zealand will assess the actions we are taking to address methane emissions, and our mix of policies and participation in international initiatives. Our Climate Change Response Act requires that we publish an Emissions Reduction Plan every 5 years. While Aotearoa New Zealand has published its first Emissions Reduction Plan with measures aimed at methane emitting sectors, future Plans will also consider and direct our efforts in these sectors.

In addition, Aotearoa New Zealand tracks and reports progress towards our climate change commitments, including in relation to methane emissions. We report and review our climate change actions, and provision and receipt of climate finance, under the United Nations Convention on Climate Change, and under the Paris Agreement, when reporting begins in 2024. Our independent Climate Change Commission also has an ongoing role in monitoring and reviewing the New Zealand Government's progress towards our emissions reduction goals<sup>xiii</sup>. Altogether, these processes mean Aotearoa New Zealand's policies and contributions to reducing methane emissions will continue to be transparently tracked and publicly available.

## V. Endnotes

<sup>i</sup> This statement is based on information in the *Fifth Assessment Report* of the Intergovernmental Panel on Climate Change. 2014. Retrieved from <https://www.ipcc.ch/assessment-report/ar5/> (September 2022).

<sup>ii</sup> Intergovernmental Panel on Climate Change. *Special Report on Global Warming of 1.5°C*. 2018. Retrieved from <https://www.ipcc.ch/sr15/> (October 2022).

<sup>iii</sup> New Zealand Government. *New Zealand Greenhouse Gas Inventory 1990-2020*. 2022. Retrieved from <https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2020/> (September 2022).

<sup>iii</sup> International Energy Agency. *Curtailing Methane Emissions from Fossil Fuel Operations*. 2021. Retrieved from <https://www.iea.org/news/tackling-methane-emissions-from-non-biogenic-fuel-operations-is-essential-to-combat-near-term-global-warming> (October 2022).

<sup>iv</sup> Ministry for the Environment. "Emissions budgets and the Emissions Reduction Plan". 2022. Retrieved from <https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-budgets-and-the-emissions-reduction-plan/> (December 2022).

<sup>v</sup> Aotearoa New Zealand's agricultural sector has reporting requirements in the NZ ETS at this time, but no surrender obligations.

<sup>vi</sup> FAO, UNDP and UNEP. 2021. *A Multi-Billion-Dollar Opportunity – Repurposing agricultural support to transform food systems*. 2021. Retrieved from <https://doi.org/10.4060/cb6562en> (October 2022).

<sup>vii</sup> Based on New Zealand Greenhouse Gas Inventory 1990-2020.

<sup>viii</sup> New Zealand Government. *Aotearoa New Zealand's First Emissions Reduction Plan*. 2022. Retrieved from <https://environment.govt.nz/assets/publications/Aotearoa-New-Zealands-first-emissions-reduction-plan.pdf> (October 2022).

<sup>xi</sup> Based on New Zealand Greenhouse Gas Inventory 1990-2020.

<sup>x</sup> Energy Resources Aotearoa. "Net Zero Accord". Energy Resources Aotearoa. <https://www.energyresources.org.nz/publications> (September 2022).

<sup>xi</sup> Information about the types or classes of landfills in Aotearoa New Zealand is available in the fact sheet *Waste levy – Determining your disposal facility class*. 2021. Retrieved from <https://environment.govt.nz/assets/Determining-your-disposal-facility-class-factsheet-final.pdf> (December 2022).

<sup>xii</sup> Ministry for the Environment. "Waste disposal levy expansion". 2022. Retrieved from <https://environment.govt.nz/what-government-is-doing/areas-of-work/waste/waste-disposal-levy/expansion/> (December 2022).

<sup>xiii</sup> Climate Change Response Act 2002, section 5B Purposes of Commission. Retrieved from <https://www.legislation.govt.nz/act/public/2002/0040/latest/DLM158584.html> (September 2022).



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