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CHAPTER 11:

# Energy and industry



# Energy and industry

## Lead



MINISTER OF ENERGY  
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## Supporting

- ▶ Chief Executive of the Energy Efficiency and Conservation Authority



### Contribution to our long-term vision

By 2050, our energy system is highly renewable, sustainable and efficient, and supports a low-emissions and high-wage economy. Energy is accessible and affordable and supports the wellbeing of all New Zealanders. Energy supply is secure, reliable and resilient, including in the face of global shocks.



### Contribution to Aotearoa New Zealand's greenhouse gas emissions (AR5) in the first emissions budget period

Projected emissions without the initiatives in this plan	72.4 Mt CO <sub>2</sub> -e
Projected average annual emissions without the initiatives in this plan	18.1 Mt CO <sub>2</sub> -e
Projected percentage of total gross emissions without the initiatives in this plan	22 per cent
Estimated emissions reduction from the initiatives in this plan	2.7 to 6.2 Mt CO <sub>2</sub> -e

## Energy and industry



### Why energy and industry is important

The energy and industry sectors make up just over a quarter of our total gross greenhouse gas emissions.

Aotearoa New Zealand is well-positioned to tackle emissions in the energy and industry sectors because of our high levels of renewable electricity. Decarbonising the energy sector has a range of benefits – creating opportunities to reduce emissions in other sectors, reducing reliance on global fossil fuel markets, reducing costs through energy efficiency and clean technology, and creating high-wage job opportunities.



### Key actions

- ▶ Use energy efficiently, lower costs and manage demand for energy by:
  - improving business and consumer energy efficiency through programmes such as [Equipment Energy Efficiency \(E3\)](#), [Gen Less](#) and [Support for Energy Education in Communities](#)
  - helping low-income New Zealanders have warmer, drier homes through [Warmer Kiwi Homes](#).
- ▶ Ensure the electricity system is ready to meet future needs by:
  - investigating the need for electricity market measures to support the transition to a highly renewable electricity system and investigating options for electricity storage in dry years
  - reducing barriers to developing and efficiently using electricity infrastructure, including transmission and distribution networks
  - supporting renewable and affordable energy in communities through the [Māori and Public Housing Renewable Energy Fund](#).

## Energy and industry



### Key actions continued

- ▶ Reduce our reliance on fossil fuels and exposure to volatile global fuel markets, and support the switch to low-emissions fuels by:
  - setting a pathway to reduce reliance on fossil gas through a gas transition plan
  - increasing access to low-emissions fuels, including developing a hydrogen roadmap.
  
- ▶ Reduce emissions and energy use in industry by:
  - supporting industry to improve energy efficiency, reduce costs and switch from fossil fuels to low-emissions alternatives through the [Government Investment in Decarbonising Industry fund](#) and [the Energy Efficiency and Conservation Authority's business programmes](#)
  - banning new low- and medium-temperature coal boilers and phasing out existing ones by 2037.
  
- ▶ Set a strategy and targets to guide us to 2050 by:
  - setting a target for 50 per cent of total final energy consumption to come from renewable sources by 2035
  - developing an energy strategy to address strategic challenges in the energy sector and signal pathways away from fossil fuels.

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# We need to establish a sustainable, secure and affordable energy system for a low-emissions economy

The Government's 2050 vision for energy and industry is for Aotearoa New Zealand to have a highly renewable, sustainable and efficient energy system supporting a low-emissions economy.

- ▶ Energy will be accessible and affordable and will support the wellbeing of all New Zealanders.
- ▶ Energy supply will be secure, reliable and resilient, including in the face of global shocks.
- ▶ Energy systems will support economic development and an equitable transition to a low-emissions economy.

To achieve this future, Aotearoa needs to move away from fossil fuels and shift towards increased renewable electricity generation, and the development and use of other low-emissions fuels.

A well-planned transition can help reduce energy costs for businesses and New Zealanders, increase energy independence and create high-wage jobs in areas such as hydrogen, bioenergy and electrification. It can also be an opportunity to improve our productivity as we adopt clean technologies and improve energy efficiency.

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# The energy and industry sectors are vital for achieving Aotearoa New Zealand's emissions budgets

In 2019, emissions from the energy and industry sectors made up just over a quarter (27 per cent) of our total gross emissions.

The energy and industry sectors are essential to the economy and the lives of New Zealanders. Their performance affects the competitiveness of Aotearoa businesses and the cost and quality of many goods and services. Energy heats our homes and powers our transport. Industry accounts for around 11 per cent of real gross domestic product and employs 9 per cent of our workers.

Aotearoa New Zealand's energy system is highly renewable by international standards. Just over 40 per cent of our total primary energy supply<sup>1</sup> and nearly 28 per cent of our total final energy consumption<sup>2</sup> comes from renewable energy sources.

1 Total primary energy supply is the amount of energy available for use in Aotearoa, accounting for imports and exports.

2 Total final energy consumption is the total energy consumed by end users, such as households and industry. It excludes energy that the energy sector uses itself, energy transformation and distribution losses.

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## Increasing our energy independence

Aotearoa meets much of its energy needs by producing energy domestically. The transition to a more renewable energy system will strengthen our energy independence and ensure our energy supply is affordable and secure in the face of global shocks. The actions in this plan will achieve this by:

- ▶ reducing our exposure to international oil markets by accelerating the uptake of low-emissions vehicles and diversifying into new fuels
- ▶ using our highly renewable electricity system to further electrify industry and transport
- ▶ giving New Zealanders more control of their energy use so that they can save money.

### Current and projected energy and industry emissions

References to current energy and industry emissions are based on to the 2019 greenhouse gas estimates from New Zealand's Greenhouse Gas Inventory 1990-2020 published in April 2022.

Energy and industry emissions estimates are around 6 percent higher than the previous New Zealand's Greenhouse Gas Inventory 1990-2019 published in April 2021. This rise is due to a reallocation of fuel use from the transport sector to the rest of the energy sector and implies that underlying road transport fuel efficiency is higher than previously estimated.

Projected emissions for energy and industry, including emissions reductions, are based on the previous 1990-2019 greenhouse gas inventory, because the energy and industry models used could not be updated in time for publication. This means that projected energy and industry emissions and emissions reductions are likely to be higher when the Government revises its projections using the latest inventory data.





### CUTTING COAL AND CARBON EMISSIONS AT SILVER FERN FARMS

Silver Fern Farms received NZ\$1 million co-funding from the Government Investment in Decarbonising Industry (GIDI) fund for a NZ\$2.6 million project at its Pareora processing site, south of Timaru. With the support of GIDI co-funding, the company will install a high temperature heat pump to preheat hot water for the processing plant, shifting heating load away from the existing coal boiler. It is the company's third successful project under the GIDI fund.

The benefits will be substantial and include reductions in coal consumption, the associated reduction in greenhouse gas emissions, cost savings as the heat pump system generates hot water at a lesser running cost than coal boilers, and reduction in remaining water heating loads, opening up a variety of possibilities to achieve the final water heating needed.

The current boiler used 27.3 gigawatt hours of coal energy input in 2020 to produce hot water for the site. Using coal to generate this energy produces 8,389 t CO<sub>2</sub>-e of emissions each year compared to the proposed project emissions of 2,813 t CO<sub>2</sub>-e per year – a 66 per cent reduction. The annual net emissions savings from implementing this project are 5,576 t CO<sub>2</sub>-e.

Silver Fern Farms has previously taken a structured approach to reducing energy and carbon emissions, including metering, gap analysis, conservation measures and efficiency gains. The GIDI funding enables the company to accelerate its coal related projects to reduce its carbon footprint in a much shorter timeframe.

The new system is expected to be fully commissioned by the end of December 2022.



## Reducing energy and industry emissions will drive down emissions in other sectors

Actions in the energy and industry sectors help to achieve emissions reductions in other sectors, including transport and building and construction. They also contribute to new economic opportunities. For example:

- ▶ accelerating the rollout of renewable electricity generation and infrastructure for electrification (such as electric vehicle chargers) will accelerate replacing fossil fuels in other sectors
- ▶ low-emissions fuels, such as biofuels and green hydrogen, will help decarbonise our transport system
- ▶ improving the operational efficiency of buildings will directly reduce energy emissions.



CASE STUDY

### LESS ENERGY, LESS WATER, LESS WASTE: GOVERNMENT INVESTMENT IN DECARBONISING INDUSTRY (GIDI) FUND REDUCES EMISSIONS AT WHAKATĀNE MILL

Whakatāne Mill produces 150,000 tonnes of paperboard a year and runs 24 hours a day, 7 days a week. With over 170 people working at the mill, it is the biggest employer in the region and a significant contributor to the local economy. The GIDI fund is supporting the mill to invest in a new filter system that will significantly reduce emissions and water waste.

The project will install a disc filter and other equipment to return the mill's waste water to be reused. This circular system saves on water, raw materials, and the energy used to heat the water, delivering significant benefits, including:

- ▶ reducing energy-related carbon emissions by about 21,600 tonnes each year
- ▶ reducing methane and CO<sub>2</sub> emissions from landfill by about 3,000 tonnes each year
- ▶ reducing wood and electricity consumption by returning about 4,000 tonnes of fibre to the process instead of sending them to landfill.

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# Actions we are taking to reduce energy and industry emissions

This section outlines the Government's approach to reducing energy and industry emissions. The short-term focus is to reduce energy and industry emissions through the uptake of new and existing technologies, and ensure our markets and regulations are fit for a low-emissions future. To enable future action, the Government will clearly communicate the approach to decarbonisation and diversification into new fuels.

The following actions to reduce energy and industry emissions will support equitable and inclusive outcomes. This means working to improve energy efficiency and affordability as Aotearoa transitions to a low-emissions economy.

To achieve an equitable transition for Māori, the Government will uphold Te Tiriti o Waitangi, recognise Māori interests in the energy and industry sectors, and work with tangata whenua as policies to transition the energy and industry sectors are developed and implemented. This is critical, especially when identifying challenges and ensuring they are addressed in a way that enables and empowers Māori.

## Five focus areas will help achieve a low-emissions energy system that supports New Zealanders' wellbeing

Efforts to drive emissions reductions in the energy and industry sectors focus on five interdependent areas. The actions in these focus areas complement the New Zealand Emissions Trading Scheme (NZ ETS). They are designed to address barriers in responding to the emissions price and minimise impacts on households, businesses, communities and Māori, while unlocking health and other benefits.

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## Focus area 1: Use energy efficiently and manage demand for energy

Improving our energy efficiency – using less energy to perform the same task – can reduce emissions and costs. Optimising our energy use and energy productivity will support economic prosperity and an equitable transition as we decarbonise.

Energy efficiency can also improve our wellbeing by reducing household energy bills. We can take actions to get the most out of the energy Aotearoa generates and help households, communities and businesses manage their energy demand.

Electrical energy efficiency and measures to help manage electricity demand will also help to reduce emissions from the electricity system (focus area 2). It will also help to reduce both demand-side costs (eg, allowing smaller heat appliances) and supply-side costs (eg, less investment needed in new generation, transmission and distribution capacity).

This will help the electricity system to more easily meet demand and lower the costs of electrifying transport and process heat.

This focus area includes actions to improve:

- ▶ business and household energy efficiency
- ▶ the state sector's energy efficiency and fuel switching.

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## Action 11.1.1: Improve business and household energy efficiency

Improved energy efficiency reduces the need for new electricity generation and ensures New Zealanders can affordably light and heat their homes, power their businesses, and meet other energy needs. Supporting households and businesses to actively manage their energy demand gives them greater control, including over their costs.

### *Key initiatives*

- ▶ Improve business and household energy efficiency through programmes such as [Equipment Energy Efficiency \(E3\)](#) and [Gen Less](#).
- ▶ Improve energy efficiency products and services regulation to support our energy efficiency and emissions reductions goals.<sup>3</sup>
- ▶ Help low-income New Zealanders achieve warmer, drier homes by delivering the [Warmer Kiwi Homes](#) programme, which offers grants for insulation and heating.
- ▶ Continue to support low-income households to improve their energy efficiency to reduce their energy costs and emissions.
- ▶ Deliver the [Support for Energy Education in Communities](#) programme. This helps community organisations provide advice to help manage energy demand, and low-cost equipment to improve energy efficiency in households facing energy hardship.
- ▶ Provide rebates to businesses for installing high energy efficiency equipment, including electric motors and heat pumps. This will accelerate the uptake of high efficiency equipment, rather than the default replacement option or minimum compliant specification.
- ▶ Investigate additional programmes to improve the energy performance of existing buildings (see focus area 3, improving building energy efficiency).

<sup>3</sup> The Government is considering feedback on proposals in the [Energy efficient products and services](#) discussion document, which was released for public consultation in June 2021.

### **Action 11.1.2: Improve the state sector’s energy efficiency and fuel switching**

The state sector is a significant energy user. Improving energy efficiency and switching to low-emissions fuels and technologies will reduce emissions and demonstrate leadership as Aotearoa transitions.

#### *Key initiative*

Implement the NZ\$220 million State Sector Decarbonisation Fund (component relating to energy and industry) to reduce state sector emissions. The fund increases energy efficiency and the use of renewable energy in the state sector. It focuses on replacing the largest, most-used fossil-fuel boilers with low-emissions alternatives. Co-funding is also available for other projects, including electric vehicles (see [chapter 6: Funding and finance](#)).

## **Focus area 2: Ensure the electricity system is ready to meet future needs**

Our high level of renewable generation means our electricity system is well positioned to help other sectors – such as transport and industry – move away from fossil fuels and reduce emissions.

Transpower New Zealand estimates Aotearoa will need 70 per cent more renewable generation to electrify process heat and transport, and decarbonise the economy.<sup>4</sup>

To transition our electricity system to 2050, we need to:

- ▶ accelerate development of new renewable electricity generation across the economy
- ▶ ensure the electricity system and market can support high levels of renewables
- ▶ support development and efficient use of transmission and distribution infrastructure to further electrify the economy.

4 Transpower New Zealand. 10 February 2021. *A Roadmap for Electrification: Decarbonising transport and process heat*. Retrieved from [https://www.transpower.co.nz/sites/default/files/publications/resources/Transpower\\_Electrification%20Roadmap\\_SCREEN3\\_LR.pdf](https://www.transpower.co.nz/sites/default/files/publications/resources/Transpower_Electrification%20Roadmap_SCREEN3_LR.pdf) (accessed 21 April 2022).

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## Action 11.2.1: Accelerate development of new renewable electricity generation across the economy

Aotearoa will need to generate more electricity from existing low-emissions technologies such as wind and solar. We will also need to increase our use of new technologies, for example offshore wind, and adopt electricity storage technologies such as pumped hydro and large-scale batteries.

### *Key initiatives*

- ▶ Review national direction tools for new renewable generation and electricity infrastructure, including small-scale generation. The review will determine whether – and how – resource consent processes could be improved.
- ▶ Develop regulatory settings to enable investment in offshore renewable energy (such as offshore wind farms) and innovation. Regulatory settings are expected to be in place by July 2024.
- ▶ Help government agencies and local government explore purchasing electricity from new renewable electricity generation projects, for example, via long-term power purchase agreements.
- ▶ Support renewable and affordable energy in communities, including through the [Māori and Public Housing Renewable Energy Fund](#). This fund trials community-scale renewable technologies such as modern geothermal, solar panels and batteries. The most recent round made funding available for larger, more complex, renewable energy technologies, such as small-scale hydro, wind energy generation and projects integrating remote distribution and retail solutions.

## Action 11.2.2: Ensure the electricity system and market can support high levels of renewables

Our transition to a more renewable electricity system needs to be orderly, affordable, maintain reliability and incentivise businesses to switch to low-emissions fuels.

Work is already underway to ensure the electricity market and system can operate with an increasing proportion of renewable electricity. This includes how to manage dry-year risk<sup>5</sup> and meet household winter heating needs in an affordable way.

### Key initiatives

- ▶ Investigate options for dry-year electricity storage through the New Zealand Battery Project. Options include pumped-hydro storage, demand-side response, bioenergy, geothermal energy, hydrogen and other technologies. Phase one, examining option feasibility, is expected to be complete by the end of 2022.
- ▶ Investigate the need for electricity market measures by 2024 that support affordable and reliable electricity supply while accelerating the transition to a highly renewable electricity system.
- ▶ Investigate future security and electricity system resilience as we move toward 100 per cent renewable electricity. From July 2022, the Electricity Authority and Transpower New Zealand will start a programme of studies and solutions to address challenges and opportunities.
- ▶ Ban new fossil-fuel baseload electricity generation, to send a clear message that this has no future in Aotearoa.
- ▶ Implement recommendations from the Government's Electricity Price Review 2019 to reduce energy hardship and improve energy affordability. This includes establishing an energy hardship expert panel and reference group, and developing a definition and indicators to identify those in energy hardship.

5 Aotearoa New Zealand's electricity system has a high level of hydro-generation. In dry years, water for hydro-generation is limited. The electricity shortfall has usually been met using coal and gas generation – emissions that Aotearoa would like to avoid in the future.



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### **Action 11.2.3: Support development and efficient use of transmission and distribution infrastructure to further electrify the economy**

Higher renewable electricity generation and electrification will reduce emissions and provide Aotearoa with greater energy independence. But we will need the right transmission and distribution infrastructure to cope with renewable generation's more variable peaks and flows.

Coordinated investment in network upgrades and extensions will be required to generate economies of scale that benefit generators, distributors and electricity users. Potential disadvantages for those who invest first will need to be addressed.

New technologies that change the time and direction of peak flows in electricity networks will require different approaches to network design and operation to ensure reliability.

#### *Key initiatives*

- ▶ Explore development of a Renewable Energy Zones (REZ) pilot. A REZ can expand electricity network capacity in regions where network capacity may constrain new clusters of renewable generation or industry electrification. Transpower New Zealand is exploring a pilot REZ in one region.
- ▶ Use regional energy transition plans (see action 11.4.1) to help identify network investments, to optimise industrial connection and electrification.
- ▶ Implement a new transmission pricing methodology from 1 April 2023; Transpower New Zealand is implementing a new transmission pricing methodology set by the Electricity Authority which, among other things, seeks to address potential disadvantages for early investors.
- ▶ Update electricity distribution network regulation to support the transition to a low-emissions energy system while promoting competition, reliability and efficiency for electricity users' long-term benefit. The Electricity Authority expects to engage on issues and opportunities in the second half of 2022.
- ▶ Explore measures to ensure electric vehicle charging is energy efficient and creates a platform for a flexible energy system.

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## Focus area 3: Reduce our reliance on fossil fuels and support the switch to low-emissions fuels

Aotearoa will need to replace fossil fuels with low-emissions fuels such as bioenergy and hydrogen to:

- ▶ support our electricity system to reduce coal and fossil gas use in winter peaks and dry years while maintaining security of supply and affordability
- ▶ reduce energy emissions in the short term, while renewable electricity generation increases
- ▶ provide alternatives where electrification may not be an option, such as biofuels in heavy freight and aviation.

This focus area includes actions to:

- ▶ manage the phase-out of fossil fuels, including fossil gas
- ▶ develop low-emissions fuels.

### Managing the phase-out of fossil fuels in energy and industry

The Government is working to reduce demand for coal for process heat and electricity generation. This includes investigating options to manage dry-year risk through the New Zealand Battery Project (focus area 2). A ban on new low- and medium-temperature coal boilers, as well as phasing out existing coal boilers by 2037, will further reduce demand for coal (focus area 4). Actions to manage the phase-out of fossil gas are outlined below.

Phasing out fossil fuels in energy and industry will reduce building related emissions as noted in [chapter 12: Building and construction](#).

### Action 11.3.1: Manage the phase-out of fossil gas

Phasing out fossil gas presents short-term and long-term challenges, including balancing capital investment with declining fossil gas use, fossil gas affordability and the risk of stranded network assets. The Government is working to address these challenges and set out a pathway for the fossil gas sector.

#### Key initiatives

- ▶ Develop a gas transition plan by the end of 2023. This will set out a transition pathway for the fossil gas industry, explore opportunities for renewable gases, and ensure an equitable transition. The gas transition plan will be an input to the energy strategy.
- ▶ Work with the industry co-regulator, the Gas Industry Company, to consider:
  - whether any additional or changed mechanisms are needed to ensure fossil gas is available to industrial users in times of unexpectedly tight supply
  - improving the timeliness and detail of information about fossil gas supply and demand to market participants.

### Action 11.3.2: Develop low-emissions fuels

Bioenergy<sup>6</sup> will be significant for reducing emissions, with widespread potential application in the energy, industry and transport sectors. Green hydrogen will also be significant for reducing emissions in areas of the economy that are hard to electrify, such as high-temperature industrial processes, and potentially in some parts of the heavy transport sector, including aviation.

#### Key initiatives

- ▶ Investigate low-emissions energy supply options for renewable gas and bioenergy to support future emissions reduction.
- ▶ Develop a roadmap for hydrogen in Aotearoa by 2023. This will build on the [vision for hydrogen in New Zealand](#) to set a strategy guiding investment in hydrogen, and maximising economic benefits and emissions reductions.
- ▶ Ensure hydrogen regulatory settings are fit for purpose.

6 Developing bioenergy as a low-emissions fuel links to other areas of focus and actions in this plan. Initiatives relating to developing bioenergy supply are outlined in [chapter 9: Circular economy and bioeconomy](#) and [chapter 12: Building and construction](#). Initiatives relating to supporting bioenergy demand are included in focus areas 2 and 4 of this chapter.

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## Focus area 4: Reduce emissions and energy use in industry

By 2050, Aotearoa industries will need to use low-emissions energy efficiently – both to produce the materials and goods we need and to meet consumer preferences. In the short term, changing how we use energy in industry, particularly for process heat, will be crucial to meeting our early emissions budgets.

This focus area includes actions to:

- ▶ decarbonise Aotearoa industries
- ▶ develop an approach for single-firm industries with emissions that are hard to reduce or remove.

Energy efficiency improvements and fuel switching will benefit businesses by reducing energy use, and exposure to NZ ETS costs, improving productivity, and increasing the economic resilience of domestic producers. These investments can also stimulate economic growth, job retention and creation, and help manage a smooth transition.

The Government is undertaking significant action to decarbonise process heat. These actions – alongside actions to encourage greater energy efficiency, support electrification and increase the uptake of low emissions fuels (outlined under other focus areas) – will support industrial decarbonisation and will provide signals to minimise investment uncertainty in the long term.

The Government will continue to fund fuel switching under the GIDI fund (see the Whakatāne Mill case study in this chapter). Thirty-eight projects received co-funding in the first and second rounds of the GIDI fund to help transition away from fossil fuels. Together, they will make emissions reductions of 6.56 Mt CO<sub>2</sub>e over their lifetimes.

## Action 11.4.1: Decarbonise Aotearoa industries

Opportunities to accelerate emissions reductions in industrial low- and medium-temperature process heat are significant, low cost, and can also improve productivity and increase energy resilience.

The Government is acting to decarbonise process heat and reduce industrial emissions. These actions, alongside actions to encourage greater energy efficiency, support electrification and increase low-emissions fuel use, will support industrial decarbonisation and provide clear investment signals for the future.

### Key initiatives

- ▶ By the end of 2024, set an action plan for decarbonising industry. The plan will support existing industries to decarbonise and innovative low-emissions industries to grow. The plan will sit within the energy strategy to align with the broader approach for decarbonising the energy sector, including ensuring competitive energy prices and security of supply.
- ▶ Expand and continue the roll out of the GIDI fund to accelerate emissions reductions in industry. This fund provides grants to improve energy efficiency and switch fossil fuel use to low-emissions renewable fuels. In the future, the GIDI fund will be able to provide funding for:
  - high-impact process heat decarbonisation projects
  - using regional energy transition plans to inform investment and optimise options for fuel switching at a regional level
  - additional electricity network connections and distribution network upgrades to unlock and/or accelerate fuel switching for multiple process heat users
  - more technology diffusion projects.
- ▶ Provide grant funding for decarbonising commercial space and water heating and high efficiency electrical equipment, to support a much broader segment of the business community, including smaller businesses, to transition.
- ▶ Support businesses to decarbonise through the Energy Efficiency and Conservation Authority's (EECA) [business programmes](#) and funds, including the [energy transition accelerator](#),<sup>7</sup> large energy user partnerships, sector decarbonisation plans and [technology demonstration funding](#).
- ▶ Finalise and begin to implement the [Advanced Manufacturing Industry Transformation Plan](#) by the end of 2022. The plan was created through a partnership of business, unions and the Government. It includes an action plan for creating a leading, sustainable, circular net-zero emissions manufacturing sector.

<sup>7</sup> EECA's energy transition accelerator provides bespoke technical support for large emitters to develop long-term transition plans, helping to mitigate risks.

- ▶ Implement national direction for industrial greenhouse gas emissions in the third quarter of 2022 and ensure that this can be carried through to the National Planning Framework under the proposed Natural and Built Environments Act. The national direction will ban new low- and medium-temperature coal boilers and phase out existing coal boilers by 2037.
- ▶ Develop a mandatory energy and emissions reporting scheme for large energy users by mid-2024. The scheme will require large energy users to provide energy end-use and emissions information to the Government and the public.

### **Action 11.4.2: Develop an approach for single-firm industries with emissions that are hard to reduce or remove**

Some large firms that play a significant role in Aotearoa New Zealand's economy have high-temperature heat requirements and few technologically or commercially viable alternatives to fossil fuel use. Examples are steel-making or cement-making. These firms can play a significant role in the economic and social wellbeing of our regions and in our economic resilience. To transition, they may need innovation and new technology.

#### *Key initiative*

- ▶ Develop a strategic approach or framework for addressing emissions from single-firm industries with emissions that are hard to reduce or remove. This will consider how to support innovation and the role these industries play in Aotearoa New Zealand's economic resilience and in the economic and social wellbeing of our regions.

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## Focus area 5: Strategic approaches and targets to guide us to 2050

To guide achievement of the vision for 2050 – and provide clarity to the energy sector – the Government will develop strategies and set targets for the energy system. Setting targets and monitoring energy system indicators will help measure progress towards our emissions reductions goals.

This focus area includes actions to:

- ▶ set targets for the energy system
- ▶ develop energy strategies for Aotearoa.

### Action 11.5.1: Set targets for the energy system

The Government is setting a target of 50 per cent of total final energy consumption (TFEC) coming from renewable sources by 2035. In 2020, Aotearoa New Zealand's renewable energy share of TFEC was 28 per cent.

A 50 per cent target is ambitious. It signals commitment to reducing emissions and highlights the need for transformation across the energy system – action that goes beyond business as usual. Success will depend on using our energy system to its best advantage in order to decarbonise other areas of the economy, such as transport and industry.

The renewable energy target builds on the Government's aspirational target of 100 per cent renewable electricity by 2030.

#### *Key initiatives*

- ▶ Set a target of 50 per cent of total final energy consumption to come from renewable sources by 2035.
- ▶ Monitor progress towards the Government's aspirational target of 100 per cent renewable electricity by 2030. Review this target in 2024 before developing the second emissions reduction plan.
- ▶ Develop secondary indicators alongside the targets above to:
  - measure progress towards the first four energy and industry focus areas
  - ensure the energy system remains affordable, secure and reliable as we transition.



## Action 11.5.2: Develop energy strategies for Aotearoa

The Government will develop strategies to achieve its vision for a net-zero economy in 2050, where energy is accessible and affordable, secure and reliable, and supports New Zealanders' wellbeing. This includes developing an energy strategy to address strategic challenges in the energy sector, and signal pathways away from fossil fuels.

The scope of the energy strategy is not yet confirmed, but may be structured around focus areas 1 to 4 in this chapter. It could also consider broader objectives beyond each focus area to meet our vision and support the wellbeing of New Zealanders, including how to manage pathways to ensure that:

- ▶ in addition to becoming more sustainable, our energy system is accessible and affordable, and secure and reliable, including in the face of global shocks
- ▶ energy systems support economic development aspirations and an equitable transition to a low-emissions future.

### *Key initiatives*

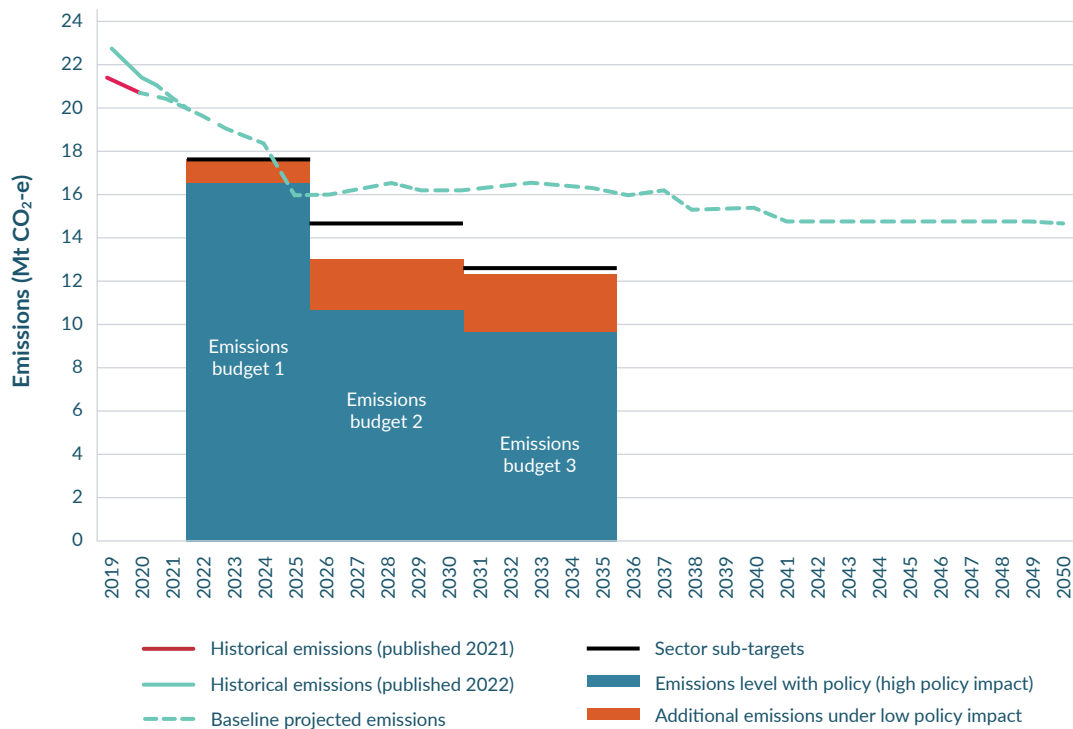
- ▶ Develop an energy strategy by the end of 2024, fully collaborating and engaging with Māori and working with energy system stakeholders.
- ▶ Develop a new New Zealand Energy Efficiency and Conservation Strategy (NZECS)<sup>8</sup> that better aligns with current energy efficiency, conservation and climate change priorities. The new NZECS will align with the emissions reduction plan and the energy strategy.

8 The New Zealand Energy Efficiency and Conservation Strategy 2017–2022 sets the overall policy direction for government support and interventions that promote energy efficiency, energy conservation and use of renewable sources of energy. The NZECS guides the EECA's work programme. The climate change and energy system priorities have changed since the current NZECS was published in 2017.

# What this means for the emissions budgets

Aotearoa is on track to meet the energy and industry sector sub-targets for the first emissions budget period, as shown in figure 11.1. The energy and industry sector is also on track to meet or exceed the sub-targets for the second and third emissions budget periods, also shown in figure 11.1. This includes emissions reductions from the actions in this plan and assumes that the NZ ETS price follows He Pou a Rangi – Climate Change Commission’s expected price path.

Figure 11.1. Energy and industry sectors’ emissions reductions



**Note:** The latest greenhouse gas inventory published in April 2022 (New Zealand’s Greenhouse Gas Inventory 1990–2020) is not consistent with the most recent transport and energy and industry emissions projections. This is due to a method change in the compilation of inventory data which reallocated some emissions from transport to non-transport energy. This resulted in a reduced level of emissions for transport and an increase in energy and industry emissions. This inconsistency will be resolved when Government emissions projections are next revised.

These projections incorporate emissions reductions as a result of Refining NZ’s transition to an import-only terminal from April 2022 and emissions reductions from a potential closure of New Zealand’s Aluminium Smelter in 2024. There is a possibility that the smelter will remain open beyond 2024. This would result in an additional 2.4 Mt CO<sub>2</sub>-e, 9.3 Mt CO<sub>2</sub>-e and 3 Mt CO<sub>2</sub>-e in emissions budgets one, two and three, respectively.

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## Reducing emissions from the energy and industry sectors requires us to work together

Reducing emissions and building a secure, affordable and sustainable energy system that supports our wellbeing requires a combined effort from all New Zealanders. Businesses, communities and government all have an important role to play.

**Local government** will need to switch to low-emissions fuels and technologies for council-owned buildings and public facilities, and improve their energy efficiency. Councils also have an important role to play in enabling the development of renewable energy and associated infrastructure via their planning functions – including spatial planning functions under the reformed resource management system.

**The private sector (businesses)** – Decarbonisation in the energy and industry sectors is dependent on the actions of the private sector. This includes large industrial and manufacturing businesses moving away from fossil fuels, electricity generators accelerating the build of renewable electricity generation and commercial sector businesses providing finance.

Significant levels of investment will be driven from the private sector in order to reduce emissions in Aotearoa’s market-based energy system and industrial sector.

## Helping the energy and industry sectors adapt to the effects of climate change

The National Climate Change Risk Assessment (NCCRA) found that climate change could increase risk to electricity generation, transmission and distribution infrastructure.

To maintain the quality and security of electricity supply, the Government needs to ensure policy and regulatory settings help asset owners respond to a changing climate. Electricity generators, retailers and distributors are incentivised, but not required, to prepare for and mitigate risks to their infrastructure, and many have asset management strategies.

The Government is developing indicators to ensure that our energy system remains sustainable, secure, reliable, accessible and affordable as we transition.

The Electricity Authority is also looking at how to ensure the electricity system remains secure and resilient as it evolves in the coming decades.

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### *Generation infrastructure*

Generation infrastructure that relies on renewable energy (such as hydro, solar and wind) is already exposed to our complex and temperate climate. Changes to average temperatures, rainfall or wind patterns, and the frequency of extreme weather events, could affect the availability of renewable energy.

Electricity generation companies are already actively assessing and planning to manage climate change risk, however, and it is likely that the diversity of renewable sources powering the national electricity grid will help maintain security of supply.<sup>9</sup>

Addressing Aotearoa New Zealand's dry-year risk will further strengthen the resilience of our electricity generation. The New Zealand Battery Project is assessing options for managing dry-year risk. Any resulting infrastructure will be designed to withstand natural and systemic risks.

### *Transmission and distribution infrastructure*

Extreme weather events and higher temperatures increase the risks to transmission and distribution infrastructure. As a result, this infrastructure needs to accommodate greater electrification and become more resilient to a changing climate.

The Commerce Commission is focused on improving asset management practices, including identifying and managing risk and resilience. It encourages electricity distribution businesses to improve their understanding of how major events and storms will impact their networks.<sup>10</sup>

Increasing demand flexibility and distributed energy resources will help to manage electricity infrastructure risk. For example, rooftop solar photovoltaic, in-home batteries, small wind turbines, micro-hydro systems and demand-response technology can improve resilience to adverse weather events or when infrastructure is damaged.

Government initiatives that reflect the future role of distributed energy resources include the [Māori and Public Housing Renewable Energy Fund](#).

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9 Ministry for the Environment. 3 August 2020. [National Climate Change Risk Assessment for Aotearoa New Zealand: Main report – Arotakenga Tūrarū mō te Huringa Āhuarangi o Āotearoa: Pūrongo whakatōpū](#). Retrieved from <https://environment.govt.nz/publications/national-climate-change-risk-assessment-for-new-zealand-main-report/> (accessed 21 April 2022).

10 Commerce Commission. 2021. [Reporting of asset management practices by EDBs: A review of target areas for potential improvements](#). Retrieved from [https://comcom.govt.nz/\\_data/assets/pdf\\_file/0027/259632/Reporting-of-Asset-Management-Practices-by-EDBs.pdf](https://comcom.govt.nz/_data/assets/pdf_file/0027/259632/Reporting-of-Asset-Management-Practices-by-EDBs.pdf) (accessed 21 April 2022).

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