



BRIEFING

ERP2 – work on opportunities for additional emissions reductions and updated energy chapter

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Date:	4 October 2024			Priority:	Medi	um	
Security classification:	In Confidence			Tracking number:	BRIE	FING-REC	Q-0004469
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Action sought							
Han Simoon Bro			Action sough			Deadline	
Hon Simeon Brown Minister for Energy			Note work on opportunities for additional emissions reductions following CPMG and the draft energy chapter submitted to MfE for collation. Forward this briefing to the Minister of Climate Change.			1 2024	
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Contact for telephone discussion (if required)							
Name Position			Telephone			1st contact	
Scott Russell Manager, E Policy		Energy Use	9(2)(a)			✓	
		Policy Advisor, Energy Use Policy					
The following departments/agencies have been consulted							
Minister's office to complete:							
		☐ Noted		☐ Needs change			
		☐ Seen			Overtaken by Events		
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Comments							



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Purpose

To provide you with an update following the Climate Priorities Ministerial Group (CPMG) meeting on 23 September 2024, and a copy of the draft Emissions Reduction Plan 2 (ERP2) energy chapter which we have submitted to the Ministry for the Environment (MfE) for collation.

Recommended action

The Ministry of Business, Innovation and Employment recommends that you:

Note the work underway to consider opportunities for further emissions reductions for ERP2 following CPMG

Noted

b **Note** the draft energy chapter included in Annex One, which we have submitted to MfE for collation.

Noted

c **Advise** whether you want to include information on the biomass task force and strategic opportunities for additional industrial emissions reductions in the energy chapter.

Yes / No

d **Note** you will have a further opportunity to provide feedback on the energy chapter and wider ERP2 document through Ministerial consultation in October 2024

Noted

e **Forward** this briefing to the Minister of Climate Change.

Yes / No

Scott Russell Manager, Energy Use Policy Building, Resources, Markets, MBIE	Hon Simeon Brown Minister for Energy
4 / 10 / 2024	/ /

Background

- 1. Agencies are progressing work to finalise ERP2 ahead of its publication by the end of 2024.
- 2. On 23 September 2024 CPMG met to discuss ERP2, including possible additional policies to support achieving the second emissions budget period (EB2). This included discussion of options to pursue strategic opportunities for industrial emissions opportunities and conversations around options to incentivise distributed solar generation.

Investigation of distributed solar and opportunities for further emissions reductions

We have considered the likely impact of further policies to incentivise distributed solar

- 3. Work is already underway to enable uptake of rooftop solar [2425-0610 refers], including:
 - a. the Electricity Authority investigating requiring retailers to better reward consumers for supplying power to the grid as part of the Energy Competition Task Force
 - b. the Government is reducing several regulatory barriers that are both slowing uptake, and driving up the cost of solar installations including updating health and safety standards and voltage limits.
- 4. We understand that CPMG included discussion on the possibility of pursuing additional policies to further incentivise solar uptake. We have carried out some initial modelling to better understand the potential impacts of achieving faster installation of distributed solar. We are not proposing this modelling be included in ERP2 as policy decisions are yet to be made.

Modelling the impact of additional rooftop solar on energy emissions

- 5. This modelling has not presumed a particular policy approach to incentivising solar (for instance by use of regulation or subsidies). Instead, we have modelled higher uptake rates of distributed solar to better understand the *consequences of achieving* higher uptake.
- 6. The modelling illustrates the possible impacts where uptake rates are increased from the current baseline scenario to a 'high solar scenario' across different sectors.

Sector	Baseline scenario	High solar scenario
Commercial	3.0%	5.0%
Industrial	2.0%	4.0%
Residential	4.0%	7.0%

Increased uptake of rooftop solar would only have a minor impact on emissions in EB2...

7. Rooftop solar capacity reaches 1,054 MW by 2040 in the Baseline scenario, but 1,499 MW in the High Solar scenario.

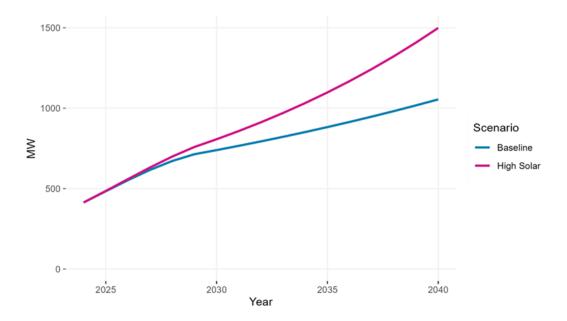


Chart 1: Total capacity of rooftop solar installations 2024-2040

- 8. This 444MW difference is roughly equivalent to a large grid scale solar farm, such as Far North Solar Farm's proposed 420MW solar farm at "The Point" near Lake Benmore. It requires installation across an additional 82,000 individual connection points, representing solar installations at roughly 11% of all connections. This amount of solar would generate approximately 1.90 TWh in 2040. For comparison, wind turbines generated 3.21 TWh in 2023.²
- 9. The additional solar capacity leads to a modest fall in electricity generation emissions overall, including a total reduction of 48.3 kt fewer CO2-equivalent emissions during EB2.
- 10. For context, in materials provided for CPMG Electrify NZ and Carbon Capture Utilisation and Storage were estimated to contribute 0.1 Mt (100Kt) and 1Mt (1000Kt) fewer emissions respectively.

...and may simply displace or delay other renewable generation

- 11. The increase in distributed solar capacity may displace or delay some other renewable build, such as wind or new run-of-river hydro, which offsets the potential emissions savings. Further, the increased proportion of solar in the generation mix can lead to an increase in coal or gas demand in some years, as solar is less likely to meet peak demand than other renewable generation types.³
- 12. However, in these modelled scenarios emissions reductions are more significant beyond 2040, as the additional solar displaces coal used for baseload generation in some years in our current model with current settings. While this is a possibility, there is less certainty regarding the overall generation mix that far in the future, which is a key determinant of these potential emissions reductions.

While distributed solar may not achieve material emissions reductions, it may have other benefits

13. Note that while distributed solar may have limited emissions reduction benefits in the near term it does have other benefits, particularly in reducing costs for energy users and increasing resilience.

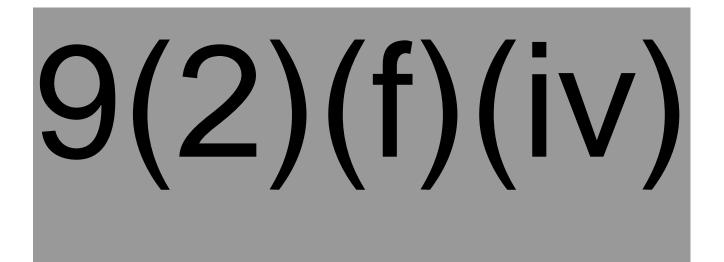
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¹ Assuming a capacity factor for solar installations of 14.5%

² Electricity | Ministry of Business, Innovation & Employment (mbie.govt.nz)

³ Because run-of-river hydro and wind are generally more reliably available to supply generation at peak times.



We have now submitted a draft energy chapter to MfE for collation

- 17. On 19 September 2024 we sent you the draft ERP2 energy chapter. We have only made minor changes to this chapter since you received it and attached the updated version with minor track changes as **Annex One**.
- 18. To reflect the ongoing work following discussions at CPMG we have included two new placeholder sections to our chapter to signal where we could reflect any work underway as part of the biomass taskforce and consideration of other strategic opportunities for additional industrial emissions reductions.
- 19. We invite your direction on whether to include content on these workstreams in the chapter.

Next steps

20. This table sets out key upcoming milestones in ERP2, noting dates are subject to change.

Milestone	Expected Date (TBC)
Sector Chapters due to MfE	4 October
Ministerial Consultation	Mid-October
ERP2 Cabinet paper lodgement	31 October
Cabinet Committee	4 November
Cabinet	11 November
ERP2 launch	Week of 9 December

Annex

Annex One: Draft ERP2 Energy Chapter

Annex One: Draft ERP2 Energy Chapter

Energy

Chapter summary box	
Lead Minister	Minister for Energy, Simeon Brown
Relevant pillar(s) of New Zealand's climate strategy	 ✓ 1. Infrastructure is resilient and communities are well prepared. ✓ 2. Credible markets support the climate transition. ✓ 3. Clean energy is abundant and affordable. ✓ 4. World-leading climate innovation boosts the economy. ✓ 5. Nature-based solutions address climate change.
Why is your sector important within the context of ERP2 and New Zealand's climate change response?	New Zealand has abundant renewable energy potential. Harnessing this will help meet our emissions budgets, reduce our dependency on imported fuels and support the reliability and affordability of the energy system.
Key actions or policies covered in the chapter	Carbon Capture Use and StorageElectrify NZ
Contribution to net emissions in the second emissions budget Projected net emissions Estimated emissions reductions from actions in the chapter	[MfE to provide].

Introduction

Affordable, secure energy is a crucial part of the Government's plans to reduce emissions.

Our electricity is expected to become even more renewable over the coming decade, with renewable sources making up most of the investment pipeline. New Zealand's clean, green electricity means electrification is a major pathway for lower emissions across the economy.

New Zealand has faced recent challenges on energy security and affordability. The Government is committed to work to alleviate these problems. Tackling security and affordability concerns is a necessary precursor to giving businesses and households the confidence to electrify and reduce their emissions.

Energy Emissions

Emissions from energy use make up 37 per cent of New Zealand's gross emissions. This includes 17.5 per cent from energy used for transport. Figure x.x shows the makeup of energy, industrial process, and product-use emissions. Vehicles and energy use in buildings make up the largest individual proportions. We expect energy emissions reductions in the second emissions budget period to come mainly from increased electrification, and energy efficiency gains in light transport and process heat.

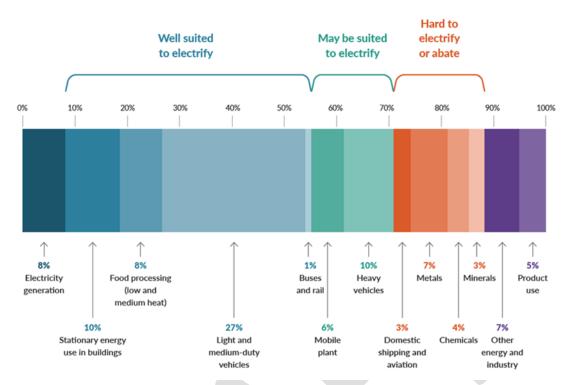


Figure x.x: New Zealand's energy, industrial process and product emissions 2022

In 2022, electricity generation accounted for about 10 per cent of New Zealand's total greenhouse gas emissions. New Zealand's electricity system has a high share of renewable generation (hydroelectric, geothermal, and wind), with only 12 per cent coming from non-renewable sources (natural gas, coal, and other) in 2023.¹

Our approach to reducing energy emissions

Role of government

It will take significant investment to meet expected demand for energy and achieve our goals. New Zealand needs investment in generation, transmission and local lines.

New Zealand's energy sector is dominated by private players. This means it is critical that we maintain investment confidence. Government intervention in the market can have a chilling effect on investment. Therefore, the Government is focused on taking an appropriate role by delivering policy certainty, regulatory certainty, and a level playing field.

Globally, New Zealand is unusual in not subsidising renewables. Renewable energy competes with fossil fuels, in part due to its abundance and because emissions pricing improves its competitiveness. Most of the known investment pipeline is green (largely solar and onshore wind, with some geothermal).¹ Decarbonisation of New Zealand's energy system will be guided by prices and markets. The Governments role is therefore to enable those markets to operate effectively.

¹ Energy in New Zealand 2024

New Zealand Emissions Trading Scheme

Emissions from our energy system are covered by the New Zealand Emissions Trading Scheme (NZ ETS). The scheme encourages net emissions reductions in the energy sector. The emissions price flows through into the price of energy sources that create emissions when they are produced or used, such as electricity, gas, diesel, petrol and coal.

We are focused on complementary policies that support a least-cost approach by expanding the opportunities to reduce emissions in an affordable way. For example, reducing the time and cost of consents for wind farms is intended to increase the competitiveness of wind generation and to encourage investment.

The role of complementary policies under an emissions cap is to unlock low-cost abatement in areas where the NZ ETS has limited impact by:

- removing unnecessary barriers to investment in low-emissions technologies
- resolving market failures, for example by investing in innovation and research and development (R&D), while providing regulatory certainty for private investment.

Chapter 4 outlines the role of the NZ ETS in incentivising net reductions, including recent decisions on ETS unit and price supply settings.

Ensuring New Zealand's energy security and affordability

Security and affordability are key to enabling emissions reductions

It is critical that the Government acts to ensure New Zealand has abundant and secure energy at internationally competitive prices.

As we have seen in 2024 our energy security and affordability are under pressure. Our gas reserves are declining, which has contributed to tight conditions in the electricity market. Insecure or expensive energy increases living costs for New Zealanders, harms our productivity and in in extreme cases can lead to the threatened or actual closure of key industries. As outlined below, the government is working to remove barriers to investment in all forms of energy to reduce tight conditions in the market.

This work is necessary because energy insecurity can also undermine our progress towards our emissions targets – end users will not have the confidence to switch to electric technologies without reliable, affordable electricity.

Comprehensive action to respond to energy affordability and security

To address the current and longer-term risks to energy affordability and security, the government is committed to four key actions:

- Urgently reverse the ban on offshore oil and gas exploration to enable domestic production of gas and increase energy affordability and security
- Improve access to gas for electricity generation by removing barriers to the construction of critically needed facilities to import of LNG
- Enable access to additional generation by reducing unwarranted restrictions on hydro contingency and potentially removing restrictions on electricity lines companies owning generation, and
- Deliver effective electricity market regulation. Here the Government has established the Electricity Competition Taskforce to ensure the efficient operation of the electricity market.

[Placeholder] The Government has also issued an Electricity Government Policy Statement to the Electricity Authority to:

- ensure the Authority is giving sufficient priority to the changes needed to electricity market settings to promote competition and security of supply; and
- ensure the sector is clear on the role the Government will play. It sets clear expectations
 to the electricity sector that they must manage their own risk. Generators will not invest if
 they think the Government may intervene.

Investment in gas can help us lower emissions

In 2023 gas contributed around 9 per cent of New Zealand's electricity generation. It also provides energy for industry, commerce and public use, and is a raw material in the production of methanol and urea. Gas-fired generation keeps electricity affordable and secure, which in turn supports electrification. Gas can also reduce our reliance on coal, which has twice the emissions impact of gas.

We expect that as consumers switch to renewable energy, the demand for gas will reduce over time. Nonetheless, we expect gas will continue to play a role in generation out to 2050. The electricity system currently relies on gas and a limited amount of coal to meet peak demand in winter and to cover dry years. Gas and coal are substitutes for each other for electricity generation. Insufficient gas supply could therefore result in New Zealand burning more coal to keep the lights on, increasing emissions from electricity generation.

Carbon Capture Use and Storage

The Government has agreed to create an enabling regime for Carbon Capture Utilisation and Storage (CCUS). The enabling regime will allow New Zealand's industries to access CCUS technology on a level playing field with other emissions reduction and removal tools to support a least cost transition towards net zero emissions. Consistent with other international jurisdictions, the regulatory regime will include the following features:

- A financial incentive for CCUS operators through the New Zealand Emissions Trading Scheme,
- · A permission and monitoring function, and
- A clear long-term liability framework.

Changes to legislation to establish the regime will be progressed through 2025.

The most likely opportunity for CCUS is for sequestration facilities to be established at existing gas fields. The regime will enable a gas operator to sequester CO2 from their own production and from third parties. This will support the possible sequestration of CO2 in the future from our hard-to-abate industries and from activities like Direct Air Capture if and when they become economically viable.

The estimated abatement from CCUS in the Emissions Budget Two and Three periods has been revised downwards since consultation. The change reflects what we have learnt through consultation, particularly about extent of likely deployment of CCUS technologies during these periods. We expect any deployment of CCUS within the Emission Budget Two and Three periods will most likely happen in the gas production sector.²

Electrify NZ is a key pillar of ERP2

We need significant investment in electricity generation and infrastructure

New Zealand's high share of renewables means that electricity is a low-emissions alternative to fossil fuels. As demonstrated in MBIE's July 2024 Electricity Demand and Generation Scenarios', demand for electricity is expected to rise significantly by 2050 as electric technologies become more widely adopted. This increase in demand will significantly outpace the demand growth seen in previous decades. Renewable generation capacity must be ready to meet this demand.

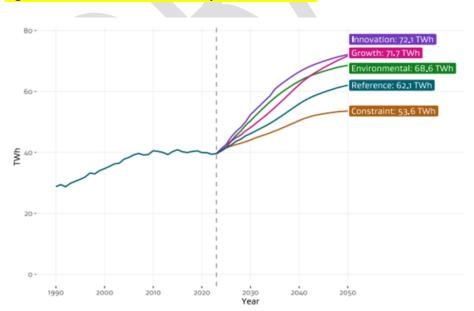


Figure x.x Total Forecast Electricity Demand – EDGS

Using currently untapped renewable energy sources, such as offshore wind, could be necessary to increase generation capacity. However, this will depend on overall demand and

² This is in additional to use of CCUS for geothermal generation, which is already happening.

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availability of onshore resources. New Zealand has world-leading offshore wind generation potential; taking advantage of this could contribute to reaching our emissions targets. However, the timeframe required for offshore wind to become economic in New Zealand is currently uncertain. The Government expects offshore renewable energy projects to compete on the same commercial basis as other forms of electricity generation.

We also need to enable significant and timely new investments in electricity transmission and distribution infrastructure. This will be critical for the reliability of our grid, particularly in a changing climate. An estimated \$100 billion of investment is needed by 2050 just to build and maintain electricity transmission and distribution infrastructure.³

Electrify NZ

The Government has committed to doubling renewable energy by 2050. Electrify NZ is the government's work programme to support private investment in in electricity generation and networks that will enable us to achieve this goal.

Electrify NZ includes the following initiatives.

- Progressing the Fast Track Approvals Bill. This will create a the one-stop-shop regime will
 provide a pathway for major renewable energy and transmission projects to be consented
 sooner and more efficiently.
- Amending the Resource Management Act (RMA) to reduce consent and re-consenting
 processing time for most renewable energy consents to be within 1 year, as well as
 extending the default lapse periods for renewable energy, transmission and local
 electricity lines consents from 5 years to 10 years. The government will also increase the
 default consent duration to 35 years for most renewable energy consents.
- RMA national direction for renewable energy and transmission the Government will advance amendments to the National Policy Statements for Renewable Electricity Generation and Electricity Transmission so they are more directive and enabling.
- Offshore renewable energy developing a regime for offshore renewable energy to be in place by mid-2025 to unleash investment in offshore renewable energy.
- Further RMA national direction to help enable a range of energy and infrastructure projects – including a new NPS-Infrastructure, and subsequent standards for different types of energy generation and infrastructure.
- A range of work is underway by the Commerce Commission and the Electricity Authority
 to update a variety of regulatory settings so that New Zealand's electricity system can
 cope with the economy-wide shift to electrification including supporting the
 Government's goal to supercharge EV infrastructure.

Enabling end-users to electrify

We want to enable energy consumers to switch to low-emissions fuels or find energy efficiencies where it makes sense to do so. This could include switching to electric technologies, including electric boilers, vehicles and heat pumps. More efficient use of

³ Boston Consulting Group. 2022. The Future is Electric. Auckland: Boston Consulting Group.

electricity and greater deployment of smart devices over time will maximise use of existing renewable generation and reduce the need for future upgrades of electricity generation and networks. This can also help reduce the need for coal and gas to meet peak demand.

This can only happen if markets and regulations are working as intended and we have a functioning competitive electricity market. To ensure this is the case and end users are in a position to make effective choices surrounding their energy use, the Government has work underway in a number of areas, as outlined below.

Placeholder – possible text box capturing additional industrial emissions opportunities including:

Genesis Energy (Biomass at Huntly)

Enabling energy efficiency and a smarter electricity system

Improved energy efficiency and a smarter electricity system will provide real benefits to New Zealand. They further enable electrification by helping maximise the use of existing renewable energy and reducing the overall need for generation and network upgrades across the electricity system. Alongside emissions reduction benefits, they also increase productivity and reduce costs on households and businesses. Actions in the building and construction chapter can also help businesses and households improve their energy efficiency by removing barriers and making better information more accessible.

We expect the ETS will continue to play an important role in incentivising businesses to improve energy efficiency. The Government is also carrying out work to support energy efficiency, including:

- Progressing amendments to the Energy Efficiency and Conservation Act 2000 (EEC Act) to
 future-proof New Zealand's energy efficiency regulatory regime. The changes will also
 enable New Zealand consumers and businesses to access products that meet the latest
 international energy efficiency standards, delivering further energy and cost savings as a
 result.
- The Energy Efficiency and Conservation Authority (EECA)'s work to provide information to businesses and households.

Work is also underway to better make our electricity system smarter so we can use the energy we have more effectively. This includes:

- Amending the EEC Act to enable standards to be set for devices with capability for demand flexibility, including EV smart chargers. This will support the uptake of EV smart charging in New Zealand and improve consumers' capability to shift demand for home EV charging away from network peaks.
- Work to create a level playing field and remove regulatory barriers to the adoption of rooftop solar. This includes exploring innovation in tariff design (such as feed-in-tariffs for

rooftop solar and battery systems) that could enhance uptake of household battery systems and encourage businesses and households to change how and when they use electricity. This will include work led by the Electricity Authority.

Promoting the affordability of New Zealand's electricity supply

As mentioned above, the Government has initiated an Energy Competition Task Force, bringing together regulatory experts from the Commerce Commission and Electricity Authority with observers from MBIE. It will assess how well the market is operating to deliver efficient investment and affordable electricity. Its work programme includes two packages:

- Enabling new generators and independent retailers to enter, and better compete in the market
- · Providing more options for end-users of electricity

The government is also working to minimise the impacts on those least able to pay. This includes through continued support for

- The Warmer Kiwi Homes Programme
- the Support for energy Education in Communities (SEEC) Programme

Ensuring the security of New Zealand's electricity supply

The Government also has work underway to further improve the security of New Zealand's electricity supply. This work includes:

- Mitigating the impact of severe weather on energy infrastructure, including through amended rules about how close trees can grow to power lines.
- Enabling the development of new fuels and technologies, including through work to improve market access for grid-scale batteries and demand-response.
- Continued support for the Community Renewable Energy Fund to build energy resilience in communities and trial innovative ways to store and distribute locally generated electricity.

Enabling a range of options for supplying energy

The Government aims to bring down the cost of abatement across the economy by enabling markets to select from a wide set of affordable low emissions options. Businesses are already scaling up use of options like bioenergy. In future, we may see more widespread adoption of technologies like hydrogen, sustainable aviation fuel, and offshore renewable energy. Getting the enabling settings right now can support future emissions budgets.

Renewable gases

Enabling the use of biomethane and hydrogen to replace natural gas provides an opportunity to improve the security of our energy supply through diversifying fuels. Using lower emissions alternatives will also reduce emissions.

There is an opportunity to utilise existing organic waste streams to capture biogas and upgrade it to biomethane. Biomethane is chemically identical to natural gas and can be injected into gas transmission and distribution networks, and used in existing appliances.

Around 4.9PJ of biogas, equivalent to approximately half of residential and commercial gas demand, is estimated to be produced by landfills, wastewater treatment plants and industrial facilities around the country every year. Much of this is currently flared to reduce its global warming potential. Some of this gas is used on-site to generate electricity and process heat. There is considerable further biogas potential from agricultural waste sources.

[Placeholder:] Some biomethane supply is expected to come online for injection into gas distribution networks during the second emissions budget period. The extent to which this supply will reduce New Zealand's emissions depends on the wider energy system. In the currently constrained supply environment, any additional supply of gas will likely result in higher overall energy consumption and would therefore be unlikely to reduce emissions. However, in times where there are not supply constraints, use of renewable gases would be likely to displace emissions-intensive sources of energy like natural gas and coal.

The Government has taken steps to create an enabling environment and remove barriers to uptake of renewable gases in New Zealand's energy system. This includes:

- [Placeholder: Should be gazetted at the end of September / will ensure alignment with waste chapter] Updating the Climate Change (Unique Emissions Factors) Regulations 2009 to allow for offsite destruction of landfill gas produced by Class 1 landfills and including a new destruction factor for upgrading biogas to biomethane. These changes will remove the disincentive under the ETS for landfill operators to provide biogas for offsite uses, including for biomethane upgrading.
- Revising the NZS 5442:2008 Specification for reticulated natural gas to be fit for purpose
 with blends of biomethane and natural gas. Further revisions to the standard are currently
 underway to consider blending of hydrogen with reticulated natural gas and biomethane.

The Government is continuing to explore what additional measures are needed to increase the uptake of renewable gases in New Zealand's energy system. We will also take an enabling approach to review existing gas and other related regulations to ensure they are fit for purpose and compatible with renewable gases in the reticulated system.

Bioenergy

New Zealand has abundant bioenergy resource potential stemming from its strong plantation forestry base. Enabling greater use of bioenergy increases our low emissions fuel diversity, which in turn improves the security of our energy supply.

Bioenergy includes various products such as woody biomass (chips, pellets) for use in boilers in industry and power generation, and liquid and gaseous forms such as renewable gases and sustainable aviation fuels (SAF), which are further outlined elsewhere in this chapter.

Bioenergy has advantages over electric technologies in generating higher temperature heat

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more cost-effectively. Bioenergy can also be used in industrial applications for combined heat-and-power (co-generation), or in a hybrid fuel system where it is powered up flexibly when electricity costs are high or when there are constraints on the grid. [cross-ref to forestry and wood chapter].

Price volatility, concerns about the security of supply over the life of an industrial plant (that is 20 plus years), poor information on regional feedstock availability, and a lack of secondary processing at scale of bioenergy products (e.g. into pellets) are key constraints to further uptake.

The Government is supporting markets by providing information. EECA is publishing insights to support collaboration between demand-side and supply-side stakeholders. Through the Regional Energy Transition Accelerator programme, this work will inform private sector fuel-switching investments in the regions.

Potential location for content on Biomass taskforce

Hydrogen

Hydrogen is being trialled and demonstrated as a low-emissions alternative in heavy industry, heavy and specialty transport, production of green fuels (see below) and power generation.

It is not expected to play a significant role in meeting the second emissions budget, but near-term action in this area could help to reduce emissions in later budgets.

The Government aims to support private investment in hydrogen. It has/will publish a Hydrogen Action Plan focused on:

- Creating an enabling regulatory environment
- Reducing consenting barriers for hydrogen projects
- Creating the incentives for efficient private investment in hydrogen
- Supporting access to international investment and markets

Sustainable aviation fuels

Sustainable fuels will be needed to decarbonise the planes that carry passengers and goods to, from and around New Zealand.

The Government has funded feasibility studies with the private sector to explore domestic supply chains of alternative jet fuel options. Air New Zealand and MBIE have funded two studies investigating the feasibility of establishing SAF plants domestically, using woody biomass (forestry slash) and municipal solid waste.

[PLACEHOLDER – findings from studies / related work from the regional infrastructure fund]

EECA has also contributed funding for a feasibility study in producing SAF from green hydrogen at Marsden Point, undertaken by Fortescue Future Industries and Channel Infrastructure.