Advancing New Zealand's Energy Transition

AUGUST 2023

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Te Kāwanatanga o Aotearoa
New Zealand Government

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Ministry of Business, Innovation and Employment (MBIE) Hīkina Whakatutuki – Lifting to make successful

MBIE develops and delivers policy, services, advice and regulation to support economic growth and the prosperity and wellbeing of New Zealanders.

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Introduction

Energy keeps Aotearoa New Zealand running. We use energy for transport, heating, manufacturing, food preparation and in countless other ways.

While our energy system has served us very well, our energy use is also a major source of emissions. In 2021[1], emissions from energy made up 40 per cent of New Zealand's total gross emissions. Cutting emissions from energy is essential to meeting our international climate commitments and reducing the impacts of climate change.

The Government has committed to reaching net zero for long-lived gases by 2050, has set a target that 50 per cent of total energy consumption will come from renewable sources by 2035, and has set an aspirational target to reach 100 per cent renewable electricity by 2030.

To reach the domestic targets, and to contribute to limiting global warming to 1.5°C, we need to look across energy policy settings to ensure they facilitate the transition to a low energy system, while maintaining reliability, affordability, and supporting productivity.

The Government has a wide range of actions already underway to reduce emissions, and to encourage more renewable energy generation. This paper forms one part of a package of documents consulting on the next phase of Aotearoa New Zealand's energy transition. Each document addresses a critical aspect of the energy transition – the emerging roles for hydrogen, measures to enhance the electricity system, phasing down the use of fossil gas, and proposals for regulating a future offshore renewable energy industry.

This paper presents an overview of these energy system discussion documents, identifies cross-cutting issues, and shows how this consultation supports work towards developing an overarching Aotearoa Energy Strategy. The Energy Strategy will chart a path for the energy sector to 2050, promoting our objectives for a highly renewable, reliable, and affordable energy system that supports economic growth and productivity.

Gas Transition Plan issues paper

- Developed by MBIE in conjunction with the Gas Industry Company, the Gas Transition Plan Issues Paper seeks feedback on the strategic direction for the gas sector. The gas sector faces opportunities and obstacles in transitioning. These include ensuring that consumers have access to secure and affordable energy, not locking in older and poorly performing assets, and supporting the Government's vision for the energy and industry sector. It is almost certain New Zealand will need a level of reliable gas supply for years to come. This Gas Transition Plan Issues Paper seeks feedback on the key issues and opportunities facing the gas sector. The Issues Paper also considers the role of other opportunities for lowering emissions, like carbon capture utilisation and storage, and renewable gases like biomethane and hydrogen.

[1] https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-19902021-snapshot/#new-zealands-gross-and-net-emissions

Measures for transition to an expanded and highly renewable electricity system

- This paper looks at how we can ensure electricity is affordable, reliable and resilient while we transition to an expanded and more highly renewable electricity system. The Government has set an aspirational target of 100 per cent renewable electricity by 2030. A key issue for the energy transition is how to manage the phase out of fossil fuels in the electricity system, while responding to substantially increased electricity demand that is occurring through the electrification of other sectors (such as industry and transport). The paper sets out work already underway by government and regulators, and seeks feedback on what else might need to be considered.
- The market measures issues paper is accompanied by a separate paper - *Implementing a ban on new fossil-fuel baseload electricity generation*. This paper provides an opportunity for final feedback on the design and implementation of the emissions reduction plan action to ban new fossil-fuel baseload electricity generation.

Interim Hydrogen Roadmap

- The *Interim Hydrogen Roadmap* (the Interim Roadmap) sets out an emerging view on the potential role of hydrogen in New Zealand's energy transition, to inform where the Government should best place its effort. Providing a roadmap for hydrogen in New Zealand will also help foster certainty for investors and project developers. Feedback is sought on whether stakeholders agree with the strategic context and direction of focus in the roadmap, or whether there are other circumstances Government should consider. The Interim Roadmap suggests that hydrogen has the most potential to play a role in decarbonising New Zealand's hard-to-abate applications such as chemicals, fertiliser and parts of heavy transport (including aviation and marine), and that an industry in New Zealand could generate substantial economic activity. There is also significant international interest in New Zealand's potential for providing hydrogen to export markets.

Developing a Regulatory Framework for Offshore Renewable Energy

- Offshore renewable energy refers to the energy sources and technology used to generate electricity from such sources as offshore wind. New Zealand has world-leading offshore wind generation potential within its Territorial Sea and Exclusive Economic Zone (EEZ), which could contribute to our target of net-zero carbon emissions by 2050. The Government is consulting on a regulatory framework for offshore renewable energy in two phases. Following an initial discussion document on regulating feasibility activities, *Developing a Regulatory Framework for Offshore Renewable Energy* makes regulatory proposals for the construction, operation, and decommissioning stages. A regulatory framework is needed to incentivise developers to invest, and to manage development of the industry.

We will be consulting on the discussion documents until November. During this time, the Ministry of Business, Innovation, and Employment intends to engage with iwi, and to meet with stakeholders across communities and the energy sector.

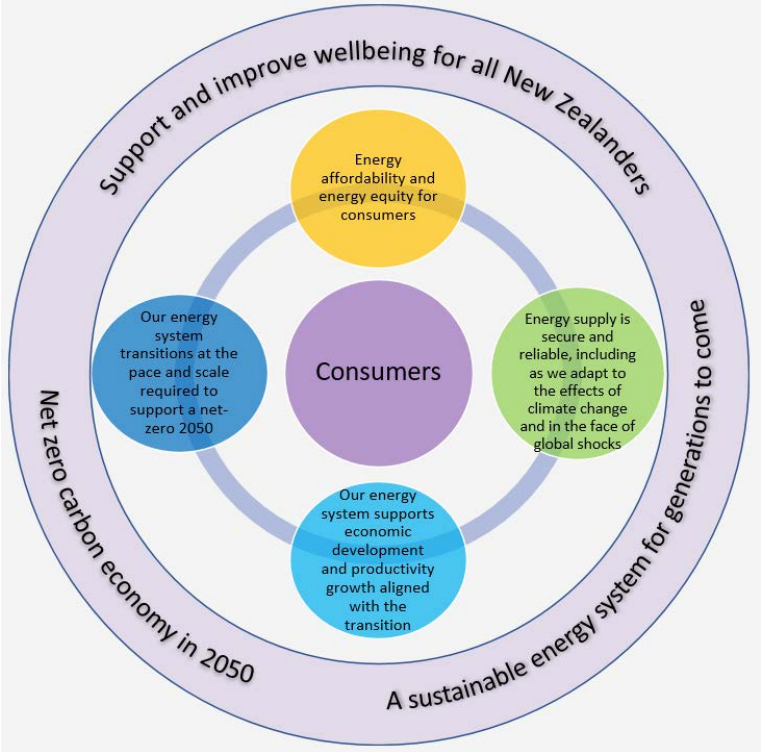
The findings from the consultation will inform near-term policy and contribute to the Energy Strategy. The Government intends to produce an Energy Strategy issues paper for consultation around the end of the year.

Towards an Energy Strategy for New Zealand

Developing an Energy Strategy for New Zealand is an action from *Te hau mārohi ki anamata*, the Government's first emissions reduction plan.

As shown in the diagram below, the Energy Strategy will set the direction for how we transition to net-zero emissions by 2050 – while ensuring:

- energy affordability and energy equity for consumers
- secure, resilient, and reliable energy supply, including as we adapt to the effects of climate change and in the face of global shocks
- an energy system that supports economic development and productivity growth aligned with the transition.



Central to the transition, and the Energy Strategy, is the way our 'energy mix' needs to change. We need to increase the role of renewables significantly, while managing the phase out of fossil fuels.

To reduce emissions, renewables need to increase as a share of our energy use from 28% to 50% by 2035, and to an even higher proportion by 2050. One role of the Energy Strategy is to set a 2050 target for renewable energy and ensure that steps taken now will enable us to get to that target.

We have a range of actions underway to achieve a successful energy transition, and the discussion documents explore further actions. But we need to understand what further steps government,

industrial users, households and communities, and the energy sector itself might need to take to reduce energy emissions. Reducing emissions includes both changing the way we generate energy, but also the volume of energy we consume.

The Energy Strategy will provide this long-term holistic plan for a highly renewable and low-emissions energy sector.

THE ENERGY STRATEGY WILL ADDRESS KEY CHALLENGES AND OPPORTUNITIES

New Zealand's energy system has served us very well. Compared to many other countries, New Zealand's energy sources are highly reliable, renewable, and affordable. Our energy system is among the greenest in the world.[2] The challenge is to increase the share of energy used that is renewable, and increase the supply of energy, while maintaining and improving affordability and reliability.

There are key pathways for New Zealand to transition to the energy system we need.

Direct electrification, such as swapping fossil fuel vehicles for electric ones, will play the major part. While New Zealand already has a high proportion of renewable electricity to enable this electrification process to occur, we need to build substantially more generation and transmission by 2050 to enable the transition. At the same time, we also need to ensure that the electricity system reduces its reliance on burning fossil gas or coal to manage those times when there isn't enough renewable electricity available due to peak demand, or intermittency (such as when the wind is not blowing, or the sun is not shining).

There will also be important roles for other green forms of energy like green hydrogen or biomass to replace fossil energy where direct electrification is not possible or economic (such as in heavy transport or industrial processes). For this wider energy use, New Zealand still has a long way to go in reducing emissions. While there are new technology options either ready for commercial deployment or near to market, producing these green forms of energy also requires some electricity, and as such, will add even more to New Zealand's future renewable electricity needs. The price of these technologies is also still uncompetitive with fossil options, but is falling over time.

Changing the way New Zealand uses energy can also have multiple benefits. By consuming less or shifting the time of use away from peak times – for example through efficiency measures, or using smart charging devices for electric vehicles – we reduce the volume of new generation, transmission, and distribution infrastructure that is required. This will reduce costs, and reduce the environmental impacts that even renewable energy generation projects can cause.

A successful transition will both achieve our emissions reduction goals and lead to cheaper and more reliable energy that supports economic growth and productivity. There are choices and challenges in managing the energy transition, and much to gain. Examples from the fossil gas industry, transport, and the potential use of hydrogen illustrate the context for our energy transition.

- We currently use fossil gas to make electricity at peak times. This ensures that electricity users have power when they need it most, which is usually in winter mornings and evenings. If fossil gas is phased down in an unmanaged way – before suitable renewable alternatives exist – there is a risk that it will simply be replaced by coal at peak times. Coal produces more emissions, could be more expensive for consumers, and could increase our exposure to global

[2] New Zealand has the tenth highest share of renewable energy amongst International Energy Agency (IEA) member countries. *New Zealand 2023, Energy Policy Review*, New Zealand 2023 – Analysis - IEA

shocks. At the same time, fossil gas operators want investment certainty about the nature and timing of the phase down so that they can continue to build and maintain fossil gas plants and fields. Without this certainty, they may not make fossil gas available.

- To take another example, one of the best opportunities for reducing fossil fuel use is the electrification of transport through technologies such as electric vehicles. Broad uptake of electric vehicles will reduce emissions, and reduce energy costs for households. While electric vehicles now make up around 1% of New Zealand's national fleet, uptake is increasing rapidly due to the Government's Clean Car Discount and increased supply and diversity of vehicles available. We need to ensure we can build enough renewable electricity and charging infrastructure fast enough to keep up with new demand, while continuing to address the relatively high upfront costs of electric vehicles.
- The role of hydrogen provides a further example of the need to manage the transition carefully. While hydrogen can support decarbonisation, hydrogen production is itself energy intensive. The more we rely on hydrogen, the more important it is to build dedicated renewable electricity generation. This effect would be especially significant if New Zealand sought to produce sufficient hydrogen for export.

While there are challenges to face, there are also significant opportunities due to New Zealand's abundant renewable energy resources. Already, innovative New Zealand companies are taking this transition forward at pace through the development of new technology, while providing new high value jobs for New Zealanders and increasing our productivity.

The transition provides an opportunity for more of these businesses and new renewable sectors to emerge within the economy. There is increasing involvement of iwi and Māori in new renewables projects, both as investors and within the workforce, and opportunities for this to grow over time. And as we reach 2050, we have the chance to reduce the costs of energy for all New Zealanders and within the economy, which will boost wellbeing and economic growth.

The Energy Strategy, due for release in late 2024, will take a whole of system view of the energy transition out to 2050.

This whole of system view will complement and build on a range of related area of work, including:

- The New Zealand emissions trading scheme
- Demand-side policies in transport, industrial process heat and waste.
- The next Emissions Reduction Plan
- Policy for skills and workforce development
- Infrastructure development policy
- Resource management policy
- Te Mana o Te Taiao, Aotearoa Biodiversity Strategy

NEXT STEPS FOR THE ENERGY STRATEGY

A discussion paper on the Energy Strategy will be released around the end of the year.

Further information on the Strategy, including information on how to get involved, is available here: New Zealand Energy Strategy | Ministry of Business, Innovation & Employment (mbie.govt.nz)

There is already a lot of work underway

There has already been significant work to support the energy transition. Notable initiatives include:

- Regional Hydrogen Transition
- Government Investment in Decarbonising Industry (GIDI) fund
- the Carbon Neutral Government Programme
- the Warmer Kiwi Homes programme
- Clean Car Discount and the development of an electric vehicle charging strategy
- the Community Renewable Energy Fund
- progressing consenting improvements for renewable electricity generation and transmission
- the New Zealand Battery Project
- progressing an Equitable Transitions Strategy

REGIONAL HYDROGEN TRANSITION

The Regional Hydrogen Transition will support early consumers of green hydrogen in New Zealand by bridging the price gap between hydrogen and fossil fuel alternatives. The rebate mechanism to deliver this outcome will be finalised following industry engagement. The goals of the initiative are:

- decarbonising hard-to-abate sectors
- economic diversification
- supporting the wider goals of the just transition

Budget 2023 provides $32.5 million over the first four years of the Regional Hydrogen Transition.

Regional Hydrogen Transition | Ministry of Business, Innovation & Employment (mbie.govt.nz)

GOVERNMENT INVESTMENT IN DECARBONISING INDUSTRY (GIDI) FUND

Industrial energy use accounts for about 25 per cent of our energy emissions and its decarbonisation is a critical component of the Emissions Reduction Plan. The GIDI fund targets these emissions by providing co-funding grants to businesses to decarbonise their use of industrial process heat through fuel switching and energy efficiency improvements. Without Government co-funding, many decarbonisation projects would present too high an upfront cost to a business, with too low a corresponding return to be prioritised or to proceed. Co-funding can also bring forward decarbonisation projects that may have occurred at a later point in time.

Through Budget 2022, GIDI funding increased by $650 million over four years to expand and accelerate what can be achieved in decarbonising our energy system, without de-industrialising it.

The recently announced partnership with New Zealand Steel is New Zealand's largest emissions reduction project to date, with half of the coal being used at Glenbrook steel to be replaced with electricity to recycle scrap steel. The Government is contributing up to $140 million to this project.

About the Government Investment in Decarbonising Industry Fund | EECA

CARBON NEUTRAL GOVERNMENT PROGRAMME

The Carbon Neutral Government Programme (CNGP) has been set up to accelerate the reduction of emissions within the public sector. Launched in December 2020, the programme aims to make a number of organisations within the public sector carbon neutral from 2025. Key initiatives in the CNGP include:

- phasing out coal-fired boilers from the public sector, with a focus on removing the largest and most active by the end of 2025
- optimising the size of agencies' car fleets and purchasing electric vehicles.

The CNGP is supported with funding from the State Sector Decarbonisation Fund.

Carbon Neutral Government Programme | Ministry for the Environment

State sector decarbonisation fund | EECA

WARMER KIWI HOMES

The Government launched the Warmer Kiwi Homes programme in July 2018 and has since completed over 110,000 heating and insulation retrofits for eligible homeowners. Six per cent of New Zealand's energy-related emissions come from households. Improving the energy efficiency of New Zealanders' homes not only reduces emissions, it also plays a vital role in ensuring whānau can enjoy warm, dry and healthy homes – without increased energy costs.

Through Budget 2023, the Government extended Warmer Kiwi Homes. The extended Warmer Kiwi Homes programme will deliver around 26,500 extra insulation and heating retrofits each year. The extended programme will help tens of thousands of New Zealanders lower their power bills and improve their health by repairing and efficiently heating their homes, and providing more energy efficient hot water heating and lighting.

Warmer Kiwi Homes programme | EECA

CLEAN CAR DISCOUNT AND THE DEVELOPMENT OF AN ELECTRIC VEHICLE CHARGING STRATEGY

Electrifying the vehicle fleet is an important step towards a net zero-carbon future. The emissions reduction plan sets out a commitment to increase zero-emission vehicles to 30 per cent of the light vehicle fleet and reduce emissions from freight transport by 35 per cent by 2035. Achieving these targets means there will be 1.5 million more EVs in the fleet by 2035. We need to invest in the appropriate public and private EV charging infrastructure ahead of this growth.

The Government's Clean Car Discount is making low emission vehicles more affordable. The discount consists of rebates and fees based on CO2 emissions for new and used eligible vehicles the first time they are registered in New Zealand. The higher the CO2 emissions, the greater the fee; the lower the emissions, the greater the rebate. Vehicles with moderate emissions will not incur a fee or be eligible for a rebate.

The national EV charging system needs to be underpinned by affordable, reliable, secure and safe electricity supply and infrastructure. The Government recently consulted on a draft electric vehicle charging strategy: *Charging Our Future*. Budget 2023 helps to provide greater certainty to New Zealanders adopting EVs by investing $120 million to expand EV charging infrastructure. This will

expand the growing national network of EV charging hubs across New Zealand, by adding 25 hubs each containing up to 20 chargers.

Electric Vehicle charging strategy: Charging our future | Ministry of Business, Innovation & Employment (mbie.govt.nz)

COMMUNITY RENEWABLE ENERGY FUND

Community-based energy initiatives that also help improve energy affordability, security and resilience, and lead to improved health outcomes.

Building on pilots funded through the Māori and Public Housing Renewable Energy Fund ($28 million in Budget 2020), the Government has committed a further $46 million (in Budget 2022 and 2023) for an expanded programme to support small-scale community renewable energy projects.

This new Community Renewable Energy Fund supports renewable generation to lower energy bills and encourage greater use of heating, leading to warmer and healthier homes. Some projects may also provide a more resilient power supply and enhance energy sovereignty by enabling local communities to generate their own power.

Community Renewable Energy Fund | Ministry of Business, Innovation & Employment (mbie.govt.nz)

PROGRESSING CONSENTING IMPROVEMENTS FOR RENEWABLE ELECTRICITY GENERATION AND TRANSMISSION

Meeting our emissions targets will require a rapid and efficient expansion of renewable electricity such as wind and solar generation. We need to boost renewable electricity generation by 170 per cent by 2050 to support increased electricity demand and to transition away from emissions-intensive fuels.[3] Significant expansion and upgrade of other parts of the electricity network will also be required to enable this renewable electricity to reach customers.

The Government, through MBIE and the Ministry for the Environment, is currently progressing proposed changes to the National Policy Statement for Renewable Electricity Generation and the National Policy Statement for Electricity Transmission under the Resource Management Act.

Consenting improvements for renewable electricity generation and transmission | Ministry of Business, Innovation & Employment (mbie.govt.nz)

NEW ZEALAND BATTERY PROJECT

New Zealand relies heavily on hydro power to generate electricity. When our existing hydro-power catchments don't receive enough rainfall or snowmelt, the level of the storage lakes runs low. We call this lack of rainfall or snowmelt our 'dry year problem'. When this occurs, some form of back-up is needed, and this is currently provided by fossil fuel generation.

As we transition from fossil fuels and increasingly rely on hydro, wind and solar, the dry year problem may expand to become a dry, calm and cloudy problem.

The New Zealand Battery Project is undertaking a significant programme of work to solve the dry year problem without using fossil fuels and support a pathway to 100 per cent renewable electricity

[3] Consenting improvements for renewable electricity generation and transmission | Ministry of Business, Innovation & Employment (mbie.govt.nz)

generation. The name, 'NZ Battery', refers to the manner in which the intended solution may provide stored energy for New Zealand's electricity system, similar to the way a battery stores energy until it's needed.

NZ Battery Project | Ministry of Business, Innovation & Employment (mbie.govt.nz)

EQUITABLE TRANSITIONS STRATEGY

The Government is developing an Equitable Transitions Strategy to help Aotearoa New Zealand tackle climate change challenges and to ensure opportunities in a low emissions future work for everyone. The strategy aims to support people through this period of change, lay the foundations for future decision-making, and uphold Te Tiriti o Waitangi. This will include proposed action areas to guide and support a fair and inclusive with a particular focus on those groups that are disproportionately affected by the transition.

The Equitable Transitions Strategy is co-led by the Ministry of Business, Innovation, & Employment and the Ministry of Social Development. There will be a range of opportunities for interested parties influence the development of the Strategy and to share their views on the policies and measures needed to assist people to manage the impacts and seize the opportunities of the transition.

https://www.mbie.govt.nz/business-and-employment/economic-development/equitable-transitions-strategy/

A package of energy sector discussion documents

We are releasing a package of discussion documents to advance New Zealand's energy transition and inform the Energy Strategy:

- *Gas Transition Plan Issues Paper*
- *Measures for transition to an expanded and highly renewable electricity system*
- *Implementing a ban on new fossil-fuel baseload electricity generation*
- *Interim Hydrogen Roadmap*
- *Developing a Regulatory Framework for Offshore Renewable Energy*

THE CONSULTATION PAPERS SUPPORT THE DEVELOPMENT OF THE ENERGY STRATEGY

Each paper supports a critical aspect of the energy transition and supports the Energy Strategy's four objectives – transition at the necessary pace and scale, affordability and equity, security and reliability, and growth and productivity. This table shows how the suite of projects discussed in this paper supports the two-phase approach to the energy strategy:

Energy Strategy	Phase 1: Exploring what's possible	Discussion paper	Phase 2: Charting the path	Final Energy Strategy
Offshore Renewable Energy	**Mid 2023** 2nd Phase of regulatory regime consultation		**2024** Working on legislation	
Advice on regulatory regime for offshore renewables				
Gas Transition Plan	**2023** GTP consultation	**2023** GTP released		
Answers particular questions regarding role of gas in the broader energy transition				
Hydrogen roadmap	**Mid 2023** Interim Hydrogen Roadmap released			**End 2024** Final hydrogen roadmap released
Outline government priorities and the potential role of hydrogen as part of the broader energy transition				
Electricity Market Measures (EMM)	**Mid 2023** EMM consultation			
Identification of measures to support reliable and affordable electricity supply through the transition				
NZ Battery Project	**Mid 2023** Cabinet report back			**End 2024** Detailed business case
Evaluating renewable technologies to address New Zealand's dry-year electricity problem				
National Policy Statement Renewable Electricity	**April 2023** Consultation released	**2023** NPS changes in force		
Strengthening government direction for consenting renewable electricity infrastructure				

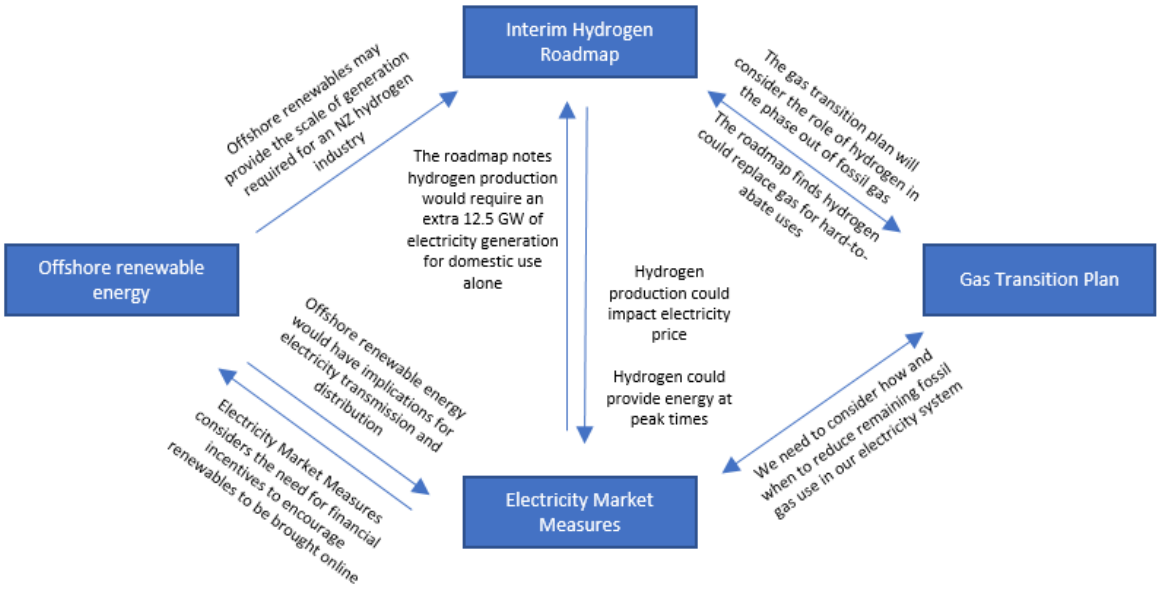
LINKAGES BETWEEN ISSUES IN THE CONSULTATION DOCUMENTS

The issues in the papers are closely interlinked and consider New Zealand's energy transition from different perspectives.

Key examples include the following:

- The *Gas Transition Plan Issues Paper* explores the options for reducing our reliance on fossil gas over time. Fossil gas currently plays a critical role in our energy system. In addition to providing heating for homes, fossil gas is currently essential for many industrial processes, and for reliably generating electricity when other sources are not available. Ensuring reliable electricity supply at all times is a central issue in the *Measures for transition to an expanded and highly renewable electricity system* discussion document.
- *Measures for transition to an expanded and highly renewable electricity system* addresses the capacity of the electricity market to produce enough new renewable electricity generation at pace, and how to ensure the right investment to move this electricity around the country. The development of a hydrogen sector, considered in the *Interim Hydrogen Roadmap*, will be reliant on this capacity becoming available.
- *Developing a Regulatory Framework for Offshore Renewable Energy* consults on proposals for regulating the construction, operation, and decommissioning stages of development. Internationally, offshore renewable energy projects, primarily offshore wind, have typically been supported by some form of revenue support or stabilisation mechanism. Some potential measures include contracts for difference and power purchase agreements. *Measures for transition to an expanded and highly renewable electricity system* considers whether there is a need for additional policies to support the development of new, large-scale renewable generation and, if so, what types of measures could be considered.
- The *Interim Hydrogen Roadmap* sets out an emerging view on the potential role of hydrogen in New Zealand's energy transition, to inform where the Government should best place its effort. Hydrogen production is energy intensive. An offshore renewable energy industry could provide the renewable electricity needed to produce green hydrogen.

The following diagram illustrates the key connections between the discussion documents.



Below, we provide more information on each of the discussion documents.

GAS TRANSITION PLAN ISSUES PAPER

Developed by MBIE in conjunction with the Gas Industry Company, the Gas Transition Plan Issues Paper seeks feedback on the strategic direction for the gas sector. The gas sector faces opportunities and obstacles in transitioning. These include ensuring that consumers have access to secure and affordable energy, not locking in older and poorly performing assets, and supporting the Government's vision for the energy and industry sector. It is almost certain New Zealand will need a level of reliable gas supply for years to come. This Gas Transition Plan Issues Paper seeks feedback on the key issues and opportunities facing the gas sector. The Issues Paper also considers the role of other opportunities for lowering emissions, like carbon capture utilisation and storage, and renewable gases like biomethane and hydrogen.

The fossil gas transition has particular relevance for the Taranaki region.

The key questions this document asks are:

- when and how should fossil gas use be phased down to help meet New Zealand's emissions reductions objectives, while maintaining security of supply for fossil gas consumers and the energy system?
- what is the appropriate role for renewable gases like biomethane and hydrogen, and technologies like carbon capture and storage, which offer promising ways to reduce emissions through the transition phase?

In addition to links to the Electricity Market Measures work, this issues paper also considers the role of green hydrogen as a replacement for fossil gas, and as such has links with the Interim Hydrogen Roadmap. Current large, or otherwise hard-to-abate fossil gas users may decarbonise their processes over time utilising green hydrogen, but this will require sufficient domestic supply to be available. The Interim Hydrogen Roadmap considers hard to abate industries as one of the priority avenues for hydrogen in New Zealand's future energy mix.

Next steps

Submissions on the consultation will inform the development of a final Gas Transition Plan.

MEASURES FOR TRANSITION TO AN EXPANDED AND HIGHLY RENEWABLE ELECTRICITY SYSTEM

Measures for transition to an expanded and highly renewable electricity system looks at how we can ensure electricity is affordable, reliable and resilient while we transition to an expanded and more highly renewable electricity system. The Government has set an aspirational target of 100 per cent renewable electricity by 2030. A key issue for the energy transition is how to manage the phase out of fossil fuels in the electricity system, while responding to substantially increased electricity demand that is occurring through the electrification of other sectors (such as industry and transport). The paper sets out work already underway by government and regulators, and seeks feedback on what else might need to be considered.

The key questions this document asks are:

- how do we ensure sufficient investment in new renewable generation to expand our electricity system for electrification and to replace retiring fossil fuel generation?
- how do we ensure adequate dispatchable generation capacity, storage or demand side response as fossil fuel plants retire and intermittent capacity grows including ensuring sufficient capacity for peaking, calm, cloudy periods, and managing the 'dry year' challenge (ahead of any NZ battery project solution)?
- how do we ensure competitive markets during transition to a more highly renewable electricity system?
- how do we grow and enhance transmission and distribution networks at a sufficient pace to meet our needs for demand growth and new renewable generation in a timely way?
- how do we support smarter use of networks and smarter technologies?

This paper has close links with the *Interim Hydrogen Roadmap* since significant green hydrogen production would require a large amount of additional renewable electricity. There are also links with *Developing a Regulatory Framework for Offshore Renewable Energy*, since offshore renewable energy could supply significant additional renewable electricity.

The market measures issues paper is accompanied by a separate paper - *Implementing a ban on new fossil-fuel baseload electricity generation*. This paper provides an opportunity for final feedback on the design and implementation of the emissions reduction plan action to ban new fossil-fuel baseload electricity generation.

Next steps

Submissions on *Measures for transition to an expanded and highly renewable electricity system* will help to determine next steps for the electricity market measures work. Any specific options to be progressed would be subject to further consultation ahead of implementation.

Following consultation on implementation issues relating to the Emissions Reduction Plan action to ban new baseload fossil fuel electricity generation, the Government will take final policy decisions later in 2023.

INTERIM HYDROGEN ROADMAP

As well as substantial amounts of new renewable electricity, New Zealand will need other forms of green energy where electrification is not possible or economic. Hydrogen is one of the key technologies being considered for playing this role, and many countries are supporting it at significant scale.

The *Interim Hydrogen Roadmap* (the Interim Roadmap) sets out an emerging view on the potential role of hydrogen in New Zealand's energy transition, to inform where the Government should best place its effort. Providing a roadmap for hydrogen in New Zealand will also help foster certainty for investors and project developers. Feedback is sought on whether stakeholders agree with the strategic context and direction of focus in the roadmap, or whether there are other circumstances Government should consider. The Interim Roadmap suggests that hydrogen has the most potential to play a role in decarbonising New Zealand's hard-to-abate applications such as chemicals, fertiliser and parts of heavy transport (including aviation and marine), and that an industry in New Zealand could generate substantial economic activity. There is also significant international interest in New Zealand's potential for providing hydrogen to export markets.

The *Interim Hydrogen Roadmap* also summarises the Government's current hydrogen initiatives, and commits to new actions, including a public-private hydrogen body and a regulatory work programme. This is in addition to funding in Budget 2023 to provide a consumption rebate for hydrogen use and a clean truck discount which will apply to hydrogen vehicles.

The key questions this document asks are:

- do you agree that hydrogen has the most potential for New Zealand in decarbonising hard-to-abate applications such as chemicals, fertiliser and heavy transport (including aviation and marine)?
- since significant renewable electricity will be needed to develop large scale hydrogen production, do you agree that government should focus any support on hydrogen for domestic use rather than for export, in the first instance?

The roadmap has close links with *Measures for transition to an expanded and highly renewable electricity system* and *Developing a Regulatory Framework for Offshore Renewable Energy* papers.

Next steps

Submissions on this consultation will be analysed and taken into account in a final Hydrogen Roadmap. A key consideration for the final Hydrogen Roadmap will be better understanding how hydrogen production interacts with the broader energy system. The final Hydrogen Roadmap is due to be published by the end of 2024, alongside the Energy Strategy.

DEVELOPING A REGULATORY FRAMEWORK FOR OFFSHORE RENEWABLE ENERGY

Many other countries are rapidly enabling offshore renewables to ensure that they can play a key role in the energy transition. If New Zealand wants the option of using offshore renewable energy to meet growing electricity demand or to enable the production of new green forms of energy like hydrogen, we will need regulatory settings for offshore renewable energy generation that encourage investment while allowing the government to select appropriate developers and projects. This includes creating opportunities for meaningful iwi participation in the operation of the offshore renewable energy regulatory regime and within the industry. Offshore renewable energy developers have shown particular interest in the Taranaki, Waikato, and Southland regions.

Developing a Regulatory Framework for Offshore Renewable Energy consults on proposals for regulating the construction, operation, and decommissioning stages of development.

This discussion document complements *Enabling Investment in Offshore Renewable Energy*, which consulted on proposals for regulating offshore renewable energy feasibility activities in December 2022.

The key question this document asks is:

- what should the commercial permitting process look like: structure, criteria, nature of permit?
- how should this interface with environmental consents?
- is there a case for revenue support and opportunities for government to gather revenue?
- who should build and own offshore transmission infrastructure?
- how do we ensure developers have the funds and financial capability to decommission properly when the time comes?

This discussion document is closely linked with *Measures for transition to an expanded and highly renewable electricity system* and the *Interim Hydrogen Roadmap*. The *Interim Roadmap* considers that hydrogen production of any scale in New Zealand will need to be enabled by large amounts of new renewable generation - it cannot be sourced from our existing capacity. Offshore renewables developments may provide the scale of generation required to underpin a New Zealand hydrogen industry, and developers are already considering this. Separately, *Measures for transition to an expanded and highly renewable electricity system* considers the need for additional financial incentives to encourage renewables to be brought online. Offshore renewables developers have argued these incentives will especially be required for the industry to develop here.

Next steps

The Government aims to finalise proposals for the complete offshore renewable energy regime later this year.

Te Kāwanatanga o Aotearoa
New Zealand Government

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