WORLD ENERGY COUNCIL

BusinessNZ Energy Council

# A Future Vision of New Zealand's Energy Sector

2026

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# 1. Purpose and Scope

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## 1.1 Why the working group was brought together

No modern economy can be productive, competitive or resilient without abundant, reliable and affordable energy.

In 2025 BusinessNZ released a report titled *"New Zealand 2050: A Long-Term Vision"*. Within that work abundant, affordable, clean energy was identified as one of New Zealand's "X-Factor" opportunities. Following on from this work the BusinessNZ Energy Council (BEC) saw it was important to explore what is needed to realise that opportunity, and identify the steps needed to be taken to ensure energy is successfully cemented as one of New Zealand's "X-Factors" and a foundation for New Zealand's long-term economic success and social well-being.

This outcome is not a guaranteed future. New Zealand's energy system is undergoing a period of significant change. Electrification, access to indigenous gas reserves, emerging technologies, increasing intermittency, changing consumer expectations and evolving business needs are all reshaping the way energy is produced, delivered and used.

We consider how New Zealand's energy system can better support productivity, unlock investment and achieve future opportunities. The focus of this work has not only been on energy as an input cost, but on energy as an enabler of economic growth, resilience, decarbonisation and international competitiveness.

> This working group was brought together to consider how New Zealand's energy system can better support productivity, unlock investment and achieve future opportunities.

## 1.2 What questions were considered

The working group considered three broad questions:

1 **Productivity**

How do energy costs, reliability, infrastructure and capability affect firm performance and economic productivity?

2 **Investment**

What do investors need from New Zealand's energy system and regulators, and where are the key barriers and enablers?

3 **Future opportunities**

What are New Zealand's credible energy-related advantages, and which sectors or opportunities could energy help unlock?

In line with these questions, the work was structured across three workstreams: productivity, energy and investment, and future opportunities. Each workstream considered issues from its own perspective before identifying priority problems, areas for further work and possible actions. The discussion in this report reflects the outputs of that process and are intended to support further discussion, refinement and prioritisation.

## 1.3 Scope of work

This report focuses on the conditions needed to deliver affordable, secure, and increasingly sustainable energy. The working group considered issues across electricity, gas and coal, liquid fuels, industrial use and transport sectors. In particular it examines where policy direction, market and regulatory settings, infrastructure planning, investment signals or better coordination could improve outcomes for New Zealand.

**The working group's work can be understood through three related layers.**

**The first layer** is the broad set of national outcomes the energy system is expected to support. A successful energy system should enable a more productive, competitive, resilient and low-emissions economy. This includes supporting business investment, industrial growth, regional development, national security, and future economic opportunity, which in turn contribute to high levels of economic welfare. These outcomes provide a strategic rationale for why this work is important.

**The second layer** is the set of energy system conditions required to support those outcomes. These include affordable and reliable energy, sufficient firm and flexible supply, efficient and timely investment, credible long-term policy and demand signals, productive energy use and clear transition pathways for fuels and technologies. These conditions link broad economic outcomes with practical areas for action.

**The third layer** is the practical focus of this report, the priority issues, actions and opportunities identified by the working group's three workstreams. This report does not seek to provide a comprehensive review of every issue facing the energy sector. Rather, it identifies the priority issues the working group considers most material to New Zealand's future energy and economic performance. The report focuses on issues where energy system settings, policy direction, investment signals or coordination could materially affect outcomes for New Zealand Inc.

With this in mind, the report uses the broad national outcomes as a strategic frame, while focusing on issues where clearer direction, better coordination or further action could improve energy and economic outcomes.

This report does not seek to provide a comprehensive review of every issue affecting New Zealand's energy system. It focuses on the matters the working group considered most important to productivity, investment and future opportunity. Where further analysis is required to progress a recommendation, it is identified within the consolidated action plan and the relevant workstream discussion.

## 1.4 Assumptions

There are several key assumptions this report has been framed around, the most important of which is the assumption New Zealand will continue to advance to net-zero and seek to meet international climate commitments, including our commitments under the Paris Agreement.

1

This report does not seek to revisit whether New Zealand should pursue emissions reduction. Rather, we have assumed that the transition to a lower-emissions economy will remain a core part of New Zealand's long-term policy and economic direction. The central question considered is how that transition can be managed in a way that strengthens, rather than weakens, New Zealand's productivity, energy security, industrial capability and long-term competitiveness.

2

A second assumption is that energy demand will continue to grow, particularly if new forms of demand emerge. This means the energy system will need to expand and grow.

3

A third assumption is that New Zealand's energy transition will not be delivered through electricity alone. Electrification will be central, but liquid fossil fuels, gas, renewable gases, biomass, geothermal energy, hydrogen and other emerging technologies may all have roles in different parts of the system.

4

Finally, we assume affordability and security of supply remain fundamental. Decarbonisation will not be durable if it results in energy becoming unaffordable, unreliable or uncompetitive. The report therefore treats sustainability, affordability, and security as interconnected objectives rather than separate goals.

# 2. Cross-Cutting Findings and Recommendations

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## 2.1 Major findings and priority recommendations

1

### Finding one

Energy must be treated as long-term economic infrastructure, not only as a stand-alone sector, supported by stable and credible policy settings that reduce sovereign risk and enable long-term investment.

### Priority recommendation

Develop an enduring, national energy strategy that explicitly balances affordability, security and sustainability while enhancing productivity. If a comprehensive bipartisan energy strategy is not achievable look to depoliticise key energy issues though an entity such as the infrastructure commission.

2

### Finding two

New Zealand's renewable resource advantage is real but is not a guaranteed economic advantage.

### Priority recommendation

Strengthen market and regulatory settings for firming, flexibility, demand response and long-duration storage to ensure renewable energy remains secure and reliable.

3

### Finding three

Affordable and predictable electricity prices are essential to enable electricity to act as a decarbonisation pathway and support industrial investment.

### Priority recommendation

Review policy or market settings that may be unnecessarily increasing electricity costs or weakening the viability of electrification as a decarbonisation pathway. Specifics are discussed later in the document.

4

### Finding four

Investment certainty and coordination are now critical system needs.

### Priority recommendation

Improve coordination across generation, transmission, distribution and major demand through forward-looking infrastructure planning, coordination mechanisms and clearer long-term signals.

5

## Finding five

Resource consenting and potential government support for major energy projects should recognise both the wider benefits and the system costs created by those projects.

### Priority recommendation

Where government is making decisions on resource consenting, fast-track approvals or enabling infrastructure, existing assessment processes should appropriately consider additional energy supply, system flexibility, domestic economic benefits and the infrastructure costs associated with the project. It should complement, rather than duplicate, existing regulatory and cost-benefit processes for investment.

6

## Finding six

Energy efficiency should be treated as a core productivity lever and this means embedding efficiency in national goals, setting clear targets, and ensuring policy settings encourage efficient energy use even in a future where prices fall significantly.

### Priority recommendation

Maintain currency of energy performance standards while expanding guidance, voluntary audits, and information on energy systems optimisation for energy intensive firms, with a focus on helping businesses identify cost-effective efficiency opportunities, track performance and embed energy management into normal business decision-making.

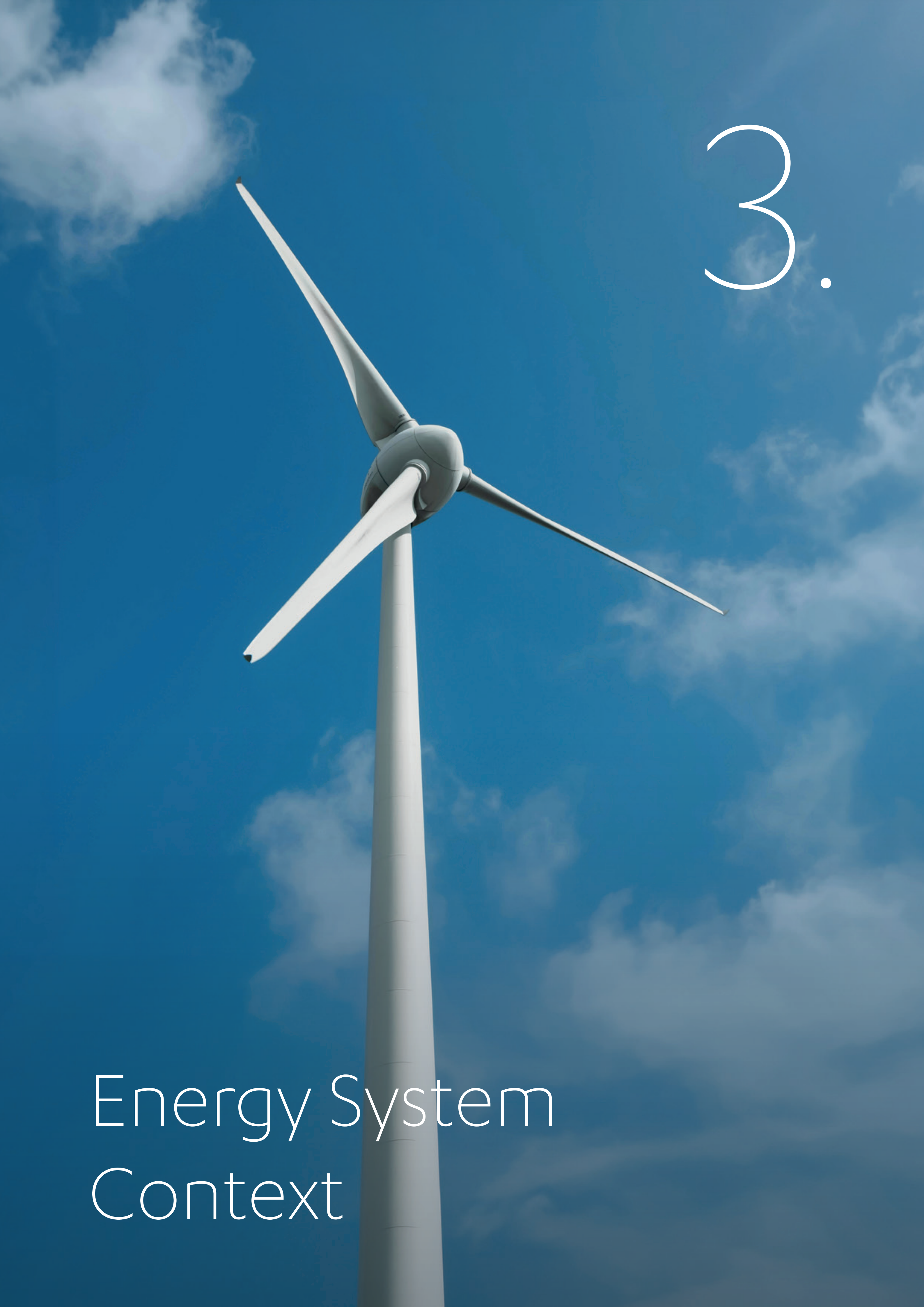
## 2.2 Consolidated Action Plan

The table below consolidates the principal actions identified across the productivity, investment and future opportunities workstreams. It is intended to provide a clear line of sight between the priority recommendations above and the steps required to deliver them.

The actions are listed in a way that they are expected to be progressed. Early actions focus on improving information, reducing uncertainty and clarifying key system assumptions. This is followed by actions focused on strengthening investment signals, coordination and regulatory settings. With the later actions focusing on enabling longer-term structural change and economic opportunity.

| | Action | Timing | Related priority |
|---|---|---|---|
| **A1** | Commission independent economic analysis of the interaction between the NZ ETS and marginal wholesale electricity pricing, including impacts on electricity prices, industrial competitiveness, investment and national emissions. | Immediate | PR3 |
| **A2** | Assess whether alternative carbon-cost recovery mechanism could ensure the electricity system meets the direct cost of emissions without unnecessarily amplifying electricity prices, while preserving efficient dispatch and investment signals for renewable generation, storage, demand response and firming. | Following A1 | PR3 |
| **A3** | Review and update New Zealand's electricity security standards and assumptions to reflect current and expected demand growth, hydro behaviour, gas availability, thermal plant availability, renewable generation, storage and demand side flexibility. | Immediate | PR2 |
| **A4** | Assess the future requirement for firm and flexible electricity capacity under a range of future scenarios. | Near term | PR2 |
| **A5** | Investigate market and regulatory settings that could improve investment confidence in firming, storage, flexible generation and demand response, including longer-duration contracting and better valuation and use of existing resources such as hydro. | Ongoing/ near term | PR2, PR4 |
| **A6** | Develop a clear and regularly updated transition pathway for natural gas, including expected domestic supply, the role of gas in electricity security and industrial use, and the expected development of alternative fuels and technologies. | Ongoing/ immediate | PR1, PR4 |
| **A7** | Improve the availability and coordination of information on future energy supply, demand, infrastructure, fuel availability and major projects, building on existing work by Transpower, Gas Industry Co and other agencies. | Near term | PR1, PR4 |
| **A8** | Identify and address barriers to longer-duration energy contracting, including power purchase agreements and other arrangements that provide greater confidence for suppliers and users. | Near term | PR2, PR4 |
| **A9** | Continue to develop an integrated view of future generation, transmission, distribution and major demand through a national development map or equivalent coordination mechanism. | Medium term | PR4 |
| **A10** | Examine whether current funding, approval and cost-allocation settings enable network infrastructure to be built ahead of need where there is a credible wider economic case, while continuing to protect consumers from inefficient overinvestment. | Medium term | PR4 |
| **A11** | Improve regulatory settings for non-network solutions and more efficient network delivery, including demand response, distributed generation, storage, dynamic pricing and distribution system operation. | Near/ medium term | PR2, PR4 |
| **A12** | Strengthen support for businesses undertaking cost-effective energy efficiency, electrification and fuel switching investment, including advice, audits, monitoring, energy systems optimisation and access to relevant technical capability. | Ongoing | PR6 |
| **A13** | Support demand-side management through smart technology, pricing and contracting arrangements that allow businesses and households to shift or manage energy use where this reduces costs, improves utilisation, and lowers system costs without unnecessarily reducing output. | Near term | PR2, PR6 |
| **A14** | Maintain and update energy performance standards, ratings and information so that households and businesses can make informed decisions when replacing equipment, upgrading or investing in new technology. | Ongoing | PR6 |

| | | | |
|---|---|---|---|
| **A15** | Improve coordination between productive electrification and electricity supply and network investment, including developing greater national consistency in the consenting, technical and pricing requirements applied by EDBs and councils to public charging infrastructure. | Near term | PR4 |
| **A16** | Assess whether existing policy and funding settings, including the gas transition loan underwriting scheme, adequately supports commercially credible industrial transition investment and recognises the wider economic value of retaining industrial capability. | Near term | PR1, PR4 |
| **A17** | Align energy infrastructure planning more closely with major processing, manufacturing, export and regional development opportunities, including the electricity, gas, liquid-fuel and emerging-fuel requirements of key regions. | Medium term | PR1, PR4 |
| **A18** | Assess where energy costs, infrastructure constraints, transition requirements or unequal exposure to carbon and regulatory costs are placing trade-exposed domestic firms at a material disadvantage or increasing the risk of deindustrialisation or offshoring. | Near term | PR1, PR3 |
| **A19** | Clarify New Zealand's long-term liquid fuel resilience requirements, including the roles of stockholding, import agreements, demand reduction, electrification and commercially credible domestic or regional alternative fuel supply. | Medium term | PR1 |
| **A20** | Develop commercially grounded pathways for emerging fuels where there is credible demand, feedstock, infrastructure and national benefit, including mechanisms to address early supply-demand coordination and offtake barriers. | Medium term | PR1, PR4 |
| **A21** | Review whether existing resource-consenting, fast-track and enabling infrastructure processes appropriately recognise the wider system benefits and costs of major projects. Any changes should be integrated into existing decision-making processes. | Near term | PR5 |
| **A22** | Identify and support regional energy and industrial hubs that coordinate energy supply, feedstocks, infrastructure, demand, skills and anchor projects. Building the capability and repeatable delivery methods needed to consent, finance, connect and deliver projects at pace. | Medium/ long term | PR1, PR4, PR5 |



# 3.

# Energy System Context

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## 3.1 New Zealand's energy advantage

Historically, New Zealand has had significant energy resource advantage when compared to many of our international competitors. The country has been blessed with a strong hydro-electric backbone, supported by geothermal, wind and thermal generation, which has facilitated a highly renewable electricity system by international standards. These resources coupled with growing solar penetration meant that through the 2025 period renewables made up 88.4% of electricity generation.

Geothermal is a particularly unique part of New Zealand's energy advantage. Unlike intermittent renewables, it can provide firm, low-emissions energy and industrial heat, supported in New Zealand by decades of globally recognised expertise. This gives New Zealand an advantage which is not easily replicated internationally.

New Zealand has also benefited from the utilisation of significant coal and natural gas resources, which for much of our modern economic history has helped underpin industrial growth, energy security and maintain competitiveness in international markets. The discovery of the Kapuni field in 1959 and the offshore Maui field in 1969 marked a major turning point. Maui was New Zealand's largest hydrocarbon discovery, a giant field relative to the size of the economy and coupled with other fields was large enough to make the country self-sufficient in gas and attract investment in industry. Its development supported electricity generation and direct industrial energy use in the North Island.

Away from the reticulated gas network in the North Island, the South Island took advantage of coal as an input to industrial activity. In regions without access to piped natural gas, coal provides a reliable and locally available source of high-temperature process heat for sectors such as dairy processing, meat processing, food manufacturing and other industrial operations. Domestic coal gives energy-intensive businesses access to firm, dispatchable and relatively affordable energy.

> Through the 2025 period renewables made up 88.4% of electricity generation.

These historical resource strengths were coupled with energy markets designed to promote competition and investment. The creation of the wholesale electricity market in the mid 1990's, the separation of generation, transmission, distribution and retail, and the introduction of independent regulation all contributed to a system in which private and public capital could be deployed into new generation, network infrastructure and energy services. While the market has never been perfect, it helped shift New Zealand away from a centrally planned energy system and created commercial signals for investment and operational efficiency.

New Zealand's strength and opportunity is not defined by a single technology or fuel type, but by a unique combination of resources, system experience, and institutional settings that can be translated into resilient, investable energy outcomes at scale.

## 3.2 A system under transitional pressure

However, many of these historical strengths are under pressure as the energy system goes through a period of significant change. The hydro-electric backbone, coupled with increased geothermal, is a major strength but remains exposed to dry-year risk. Simultaneously, electrification is beginning to drive demand growth across transport, industrial heat, buildings, and potential new sectors such as data infrastructure. As more intermittent generation enters the system the role of firming will become increasingly important for managing volatility and longer periods of low renewable output. Indigenous natural gas, which could have played this role effectively, has declined for a variety of reasons. This reduces the availability of fuel that has historically played a critical role in electricity firming as well as industrial, commercial and agri-business production. Coal is being phased out of low-medium industrial heat application by 2037* and its role in electricity generation is increasingly challenged by emission reduction commitments and consumer expectations. At the same time, if NZ is to meet economic, social and environmental objectives, investment in new generation, transmission and distribution must be delivered at a pace and scale New Zealand has not had to manage for some time.

Liquid fuels remain another critical part of the system. Diesel, petrol, jet fuel and shipping fuels continue to meet the demands of freight, agriculture, tourism, construction and essential services. While electrification and alternative fuels will reduce this demand or substitute supply over time, New Zealand remains vulnerable to international fuel supply shocks and price volatility. Large-scale electrification of transport will create more coupling between the electricity and transport sectors. These factors mean the transition must be managed as a resilience and productivity issue, not only as an emissions issue.

Emerging energy sources and technologies may help fill some gaps, but many potential options remain commercially immature or lack clear deployment pathways. Biomethane, hydrogen, sustainable liquid fuels, batteries, demand response, and distributed energy resources could all play high value roles, but their contribution will depend on cost, infrastructure, demand certainty and policy direction.

New Zealand's resource endowment is not automatically a competitive advantage. Resources become economically valuable only when they can be developed, connected to users, and delivered at prices and levels of reliability that compare favourably with alternative jurisdictions. Therefore, value is not only determined by physical availability but also relies on the policy, market, regulatory and wider settings that determine whether they can be converted into competitive outcomes.

This means New Zealand can no longer assume its historical energy advantage will automatically continue. While we still have significant advantages, and in many ways a head-start on much of the world, New Zealand remains geographically isolated, and maintaining competitiveness will require deliberate action to make sure the next phase of the energy system remains affordable and secure, while meeting expectations around sustainability. Decarbonisation is undoubtedly an important goal to meet but it must be done in a way that preserves the role energy has historically played in supporting economic productivity, social wellbeing and industrial production.

Another feature of this transition is it differs from many other historical energy shifts. Past transitions have really been energy addition rather than full substitution (although town gas did get fully substituted). Coal, oil, gas and electricity each expanded the total energy available to economies and were adopted because they provided clear improvements in productivity, convenience, cost, power density or capability. In many cases, businesses changed energy inputs because the new option offered direct and immediate commercial advantage.

* *Although this has recently come under debate again and is by no means a guaranteed future outcome.*

The current transition is different. Businesses are increasingly being asked to change fuels, technologies, processes and operating behaviour not always because the replacement immediately improves productivity or reduces cost, but because it supports long-term emissions reduction. For many firms, electrification, fuel switching, or low-emissions technology investment may involve high upfront costs, operational disruption and uncertain return on investment, while delivering limited immediate improvement in output or cost reduction.

This creates a different kind of transition challenge where it is not simply a matter of waiting for superior technologies to displace older ones through normal commercial incentives. In many cases, the benefits of transition are distributed across the wider system or economy, while the costs and risks sit with individual firms. This means the transition must be managed both as an energy system challenge and an economic productivity challenge. If businesses are expected to change energy inputs or operating models without clear, near-term commercial benefits, the surrounding settings need to give them confidence those decisions are durable, affordable and aligned with long term objectives.

## 3.3 Energy as an economic enabler

Energy is central to New Zealand's productivity and competitiveness. For businesses, energy as an input affects operating costs, investment decisions, and production reliability. For the wider economy, energy affordability and availability influence industrial development, social wellbeing and the ability to attract new economic activity.

High-income economies are typically underpinned by access to abundant, reliable and competitively priced energy with the OECD stating that competitive and transparent energy markets are essential to economic growth and social wellbeing.* In that sense, many of New Zealand's future opportunities will depend on access to reliable and competitively priced energy. This includes the ability to retain and grow existing energy intensive industries, support decarbonisation and enable new demand.

However, energy can also become a constraint. Uncertainty around Government policies, such as access to indigenous resources, the ETS settings, high or volatile energy prices, uncertainty around future fuel supply, limited network capacity, slow infrastructure development and weak long-term signals can delay or constrain investment. Where businesses cannot access energy at the right price, reliability or location, opportunities for growth may be lost.

For this reason, it is vital energy policy is not only considered through the lens of emissions reduction, but also through its contribution to New Zealand's long-term economic performance.

Capturing the value of energy also depends on the capability of energy users to exploit affordable, abundant energy. Many businesses, particularly SMEs, may lack the capital, information or technical capability to improve energy efficiency, invest in fuel switching, participate in demand flexibility or manage exposure to energy price volatility.

## 3.4 The investment and coordination challenge

As mentioned previously, the scale of investment required across the energy system is significant. New Zealand will need continued investment in renewable generation, firm and flexible capacity, transmission and distribution networks, energy efficiency, demand-side capability, emerging fuels and industrial decarbonisation.

These investments are highly interdependent. Generation investment depends on network access, consenting, market signals and demand certainty. Network investment depends on expectations about where and when generation and load will develop. Energy-user investment depends on future energy prices, infrastructure availability and confidence in technology pathways. Emerging fuels require coordination between supply, feedstock, infrastructure, new technologies, regulatory approvals and demand.

This creates a coordination challenge. In some areas, markets are delivering investment, but not necessarily the full mix of resources needed for future system security and flexibility. In other areas, investment is delayed because demand, infrastructure and policy settings are not aligned. The issue is, therefore, not simply whether investment is occurring, but whether New Zealand is enabling the right investment, in the right places, at the right time.

** C. Castle, C. Varriale. OECD. Building Competitive Energy Markets: Regulatory Insights from the OECD PMR Indicators. 2026.*

A recurring theme across the working group was that uncertainty is now a major investment barrier for both supply and demand. Long-lived energy assets require confidence that policy settings, demand signals and market frameworks will remain credible over time. Where investors face uncertainty around future fuel roles, carbon pricing, network availability or government intervention, investment may be delayed, scaled back or redirected elsewhere.

Delivery capability is also becoming a competitive advantage in its own right. In a global energy transition where capital, equipment and skills are contested, the ability to consent, connect, finance and deliver projects at pace will influence where investment flows. One of New Zealand's opportunities and challenges is to build the institutional, regulatory and workforce capability required to facilitate investment at pace.

## 3.5 The NZ Inc challenge

New Zealand's energy challenge is to maintain and strengthen the country's energy advantage while managing the energy system as an integrated whole. The energy trilemma, affordability, security and sustainability,* remains a central objective, but each aspect cannot be considered in isolation, or from the wider system settings that determine how energy is produced, transported, stored and used.

Historically, energy issues have often been considered within sector specific boundaries: electricity, gas, liquid fuels, networks, industrial heat, transport or emerging fuels. However, the transition is making these boundaries less distinct. Electrification links electricity more directly with transport, process heat and industrial growth. Declining gas affects electricity security, industrial users and future fuel choices. Network investment shapes where generation and demand can locate. Emerging fuels depend on both supply-side development and credible demand. Decisions in one part of the energy system increasingly affect outcomes elsewhere.

As demand grows, some energy inputs and infrastructure will become increasingly scarce or contested. This includes, for example, firm electricity supply, network capacity, biogenic carbon, liquid fuel alternatives and skilled labour. From an NZ Inc perspective, the question is not simply whether new demand or new supply should proceed, but whether it delivers a clear net benefit. This requires considering additionality, flexibility, local value and cost causation, whether projects bring new supply or capability, support system resilience, create durable domestic value, and fairly meet the costs they impose.

This means New Zealand's energy challenges cannot be solved through isolated interventions in individual sectors. A decision which improves outcomes in one part of the system may create costs, constraints or risks in another. For example, accelerating electrification without timely network and firming investment exacerbates reliability and affordability pressures. Reducing reliance on gas without a clear transition pathway has created risk for industrial users and electricity security. Expanding renewable generation without sufficient flexibility, storage or demand-side capability may not deliver the full system value expected.

From an NZ Inc perspective, the central question is how government can help to facilitate an energy system that supports long-term economic success across the whole economy, while maintaining a competitive market structure and the ability for investors to continue to pursue what is in their best interest. That requires considering how electricity, gas, liquid fuels, networks, demand-side resources, emerging technologies and energy users interact. It also requires clearer direction, better coordination, stronger investment signals with long-term durability and a more deliberate approach to managing outcomes across the whole system, while protecting existing property rights.

The following discussions should be read in that context. They identify the priority issues the working group considers most material to New Zealand's ability to turn energy from a potential "X-Factor" to a solidified competitive advantage.

** Based on the World Energy Council definitions. Energy Security: reflects a nations capacity to meet current and future energy demand reliably, withstand and bounce back swiftly from system shocks with minimal disruption to supplies. Energy Equity: assesses a county's ability to provide universal access to affordable, fairly priced and abundant energy for domestic and commercial use. Environmental Sustainability: represents the transition of a country's energy system towards mitigating and avoiding potential environmental harm and climate change impacts.*

# 4.

# Findings by workstream

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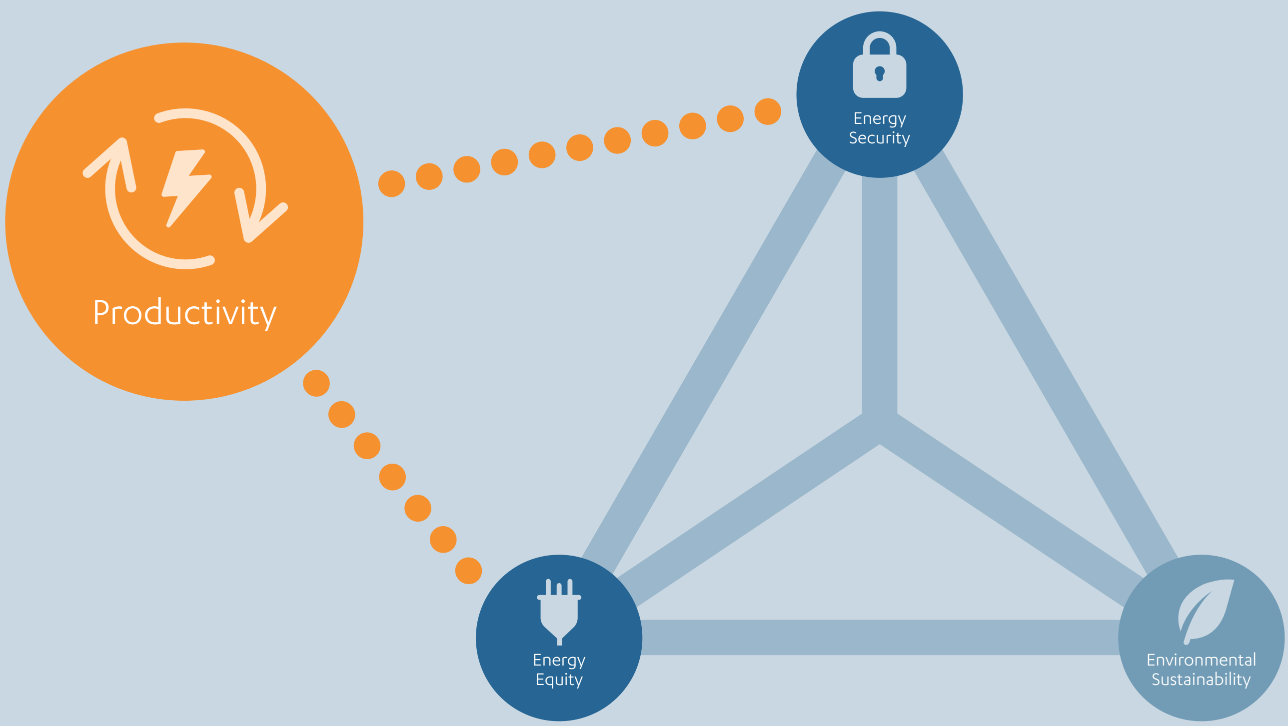
## 4.1 Productivity

Productivity is about creating more value from the resources available to an economy, including labour, capital, land, energy, knowledge and technology. It matters because it is the principle long-term driver of incomes and living standards. New Zealand's productivity has lagged behind that of other advanced economies over recent decades, while economic activity has increasingly moved towards sectors with lower levels of complexity.* Reversing this trend will require greater investment in higher-value, knowledge-intensive and technology-enabled activities, and more efficient use of New Zealand's comparative advantages and existing capabilities.

Crucially for this report energy is central to this challenge as it is both an input to almost every form of economic activity and an enabler of investment, innovation and technological change. Improving energy productivity does not simply mean using less energy, it means increasing the value created from the energy New Zealand produces and consumes. This may include improving efficiency, electrifying activities where doing so lowers cost or improves performance or shifting energy use to more productive times.

How can New Zealand not only produce more energy, while the energy system supports businesses to produce more valuable goods and services and improve international competitiveness.

Productivity is principally influenced by the security and affordability legs of the Energy Trilemma. Many factors influence these outcomes. Further considerations include policy and regulatory settings influencing energy markets as well as infrastructure costs and pricing methodologies. For this report focus is on two issues with the potential for significant direct and indirect impact.




* *MBIE, MFAT. 2025. New Zealand's productivity in a changing world. MBIE*

# 4.1.1 Issue One
# Interaction between the ETS and marginal pricing in the electricity market

### Issue One - Problem Definition

The current interaction between the NZ ETS and marginal pricing in the wholesale electricity market is creating an outcome that results in consumers paying an amplified carbon price through higher electricity prices. An unintended impact is that the higher electricity price limits decarbonisation of other sectors.

### Issue One - Context

As the country moves toward a low-emissions economy, electrification has emerged as one of the primary decarbonisation pathways for transport, industrial heat, and parts of the wider energy system. However, the current application of the New Zealand Emissions Trading Scheme (NZ ETS) into the wholesale electricity market may unintentionally reduce the affordability, security and sustainability of our total energy system.

New Zealand's wholesale electricity market is based on marginal pricing. Marginal pricing is accepted by many as the most efficient way to price electricity given the unique operational and physical constraints of different generation types.** In simple terms, wholesale prices are set by the offer price of the last tranche of available generation supply required to meet demand and charged on a half-hourly basis. During periods of tight supply, dry conditions, or peak demand, that marginal generator is often fossil-fuelled generation such as gas or coal.

Because fossil fuel generators face NZ ETS obligations, they include the cost of carbon in their offer prices. When they are marginal, this raises the market clearing price for all electricity sold in that trading period. The issue is that the carbon cost is not only paid on the emissions-producing generation, which it should be. It is also reflected in the price paid to all generation, including hydro, wind, geothermal and solar which significantly increases wholesale prices and pushes up the prices paid by all consumers.

As a result, the ETS can increase electricity prices across the whole system, despite most electricity being renewable and low emissions. This creates a structural contradiction in the wider decarbonisation framework. The NZ ETS is intended to discourage fossil fuel use, but through electricity market pricing it can also raise the price of one of the main alternatives to fossil fuels, renewable electricity.

This matters because emissions reduction opportunities depend on electricity remaining economically competitive against direct fossil fuel use. Industrial process heat conversions, electric vehicles, E-boilers, and other fuel switching decisions all rely of electricity being affordable relative to coal, gas, diesel, or petrol.

There is also an asymmetry between the percentage paid for carbon prices within the final price of electricity and engine fuels like petrol and diesel. For petrol and diesel, it is relatively direct and proportional, adding only a small percentage to the final pump price. For electricity, the percentage of the final bill impacted by carbon price can be much higher.*

This issue was highlighted in Frontier Economics's 2025 review of New Zealand's electricity market performance, which argued the effect of the NZ ETS, when passed through marginal pricing, can create windfall gains for renewable generation and impose costs on consumers well above the direct cost of electricity-sector emissions. Frontier Economics's conclusion was that electricity should be removed from the ETS, or that ETS revenue from the sector should be returned to consumers. However, peer reviews of the report were more cautious. While they accepted the ETS can increase electricity prices, they questioned whether Frontier had accounted for the role carbon prices may play in operational decisions, renewable investment, storage, demand response and firming. For this reason, the issue is best framed not as whether or not the ETS is valuable for decarbonising the electricity system, but rather if it is adequately fulfilling its role in decarbonising the wider economy. Previous work on this issue has focused on the supply side impact of windfall

** S. Came, M. Dupuy. 2005. Pricing in Wholesale Markets. New Zealand Treasury.*
** B. Layton. 2013. The Economics of Electricity. Electricity Authority.*

** Recent MBIE fuel data shows and ETS impact of ~12 c/L for petrol and ~13 c/L for diesel. In the same time period this represents ~4% of total cost. Comparatively Frontier Economics found that the ETS added ~36 NZD/MWh on average to electricity prices in 2024, which based on the 2024 average wholesale price is ~18% of total cost. While it is on average likely lower than the ~18% seen in 2024 as dry year caused greater volumes of fossil fuels to be used it is still likely a greater impact than the ~4% seen for petrol and diesel. See more in Annex One.*

gains for renewable generation. However, we believe the demand side impacts are much more significant. The cost of unintentionally inflated electricity prices is being paid by New Zealand homes and businesses. We estimate that these unintended, indirect costs may add as much as $1 Billion per year to electricity prices. These costs have reduced the competitiveness of businesses, limited productivity gains, slowed down the decarbonisation of other sectors and contributed to the cost of living of all New Zealanders.

The policy objective should not be to remove the direct cost of carbon from the electricity system altogether. The electricity system should still pay for the emissions it produces. However, the recovery mechanism should ensure that the true cost of those emissions is what is paid for, rather than allowing indirect costs to flow through to marginal pricing.

Removing the unintended, indirect cost of carbon would reduce wholesale electricity prices while preserving the principle that emissions should be paid for. It would also strengthen the economics of electrification across the wider economy. With electricity predominantly renewable, its role changes. It is not primarily a sector that needs to be decarbonised; it is the main tool for decarbonising other sectors.

There may be legitimate concerns that removing or reducing the effect of carbon costs from electricity dispatch prices could weaken operational and investment signals for new renewable generation, demand response, storage and firming capacity. Economic analysis will be needed to determine whether this impact would be greater than the benefit of removing the inflated indirect cost of carbon.

If the objective is to reduce national emissions as efficiently as possible, then policy settings should maximise the competitiveness of low-emissions electricity relative to fossil fuels. In a highly renewable electricity system, continuing to embed indirect NZ ETS costs into electricity prices may no longer deliver the most effective pathway to economy-wide decarbonisation.

## Issue One - Actions with a bias to three-months timing

Commission economic analysis to estimate the impact of indirect carbon costs in electricity dispatch prices on wholesale prices, electrification decisions, industrial competitiveness and national emissions outcomes.

Assess whether the current treatment of carbon costs in electricity prices supports or undermines whole-of-system decarbonisation, particularly where higher electricity prices may weaken the economics of fuel switching from fossil fuels to renewable electricity.

Test whether the electricity system can have a mechanism to pay the true cost of its emissions without amplifying those costs across non-emitting generation through marginal pricing.

Assess the potential impact of any reform on renewable generation investment, firming, storage, demand response and efficient dispatch.

If the above actions indicate that the electricity system is paying more than it should for carbon, then design a mechanism to change the recovery of carbon in the electricity system so that only the true cost of carbon is charged.

# 4.1.2 Issue Two
# Energy efficiency

### Issue Two - Problem Definition

There are productivity gains to be found in improving energy efficiency in New Zealand, but businesses and households may lack the capability, information, incentive or practical ability to pursue efficiency improvements even where they are cost-effective.

### Issue Two - Context

Energy efficiency can improve productivity by allowing businesses and households to get more value from each unit of energy consumed. It can reduce operating costs, lower emissions, reduce pressure on energy infrastructure, and delay or avoid the need for more generation, network or fuel investment.

However, energy is only one input among many that firms and households must manage. For firms, investment decisions are usually driven by a wider set of considerations, including labour, equipment, maintenance, production reliability, customer demand, compliance costs, finance costs and competing uses of capital. Even where an efficiency upgrade could reduce energy use, it may not be the highest-value or most urgent investment available for business.

This is why energy efficiency needs to be considered through a productivity lens rather than treated as an automatic priority. The objective should not be to pursue efficiency as the be all and end all. In some cases the most productive decision will be to wait until an asset reaches the end of its useful life, or until the efficiency gain is large enough to justify the capital cost, disruption and operational risk of replacement.

For business, energy efficiency is most valuable where it reduces input costs, improving process performance and frees up capital for other uses. For households, efficiency improvements are most attractive where they reduce bills, improve comfort or occur naturally through appliance replacement, building upgrades or renovation. For the wider system, improved efficiency can reduce peak demand, improve security of supply and lower total costs. In all cases, convenience, upfront cost and return on investment matter.

Energy efficiency is also about when and how energy is used, not just by the total volume used. Demand-side management allows businesses and households to shift, reduce or better control energy use during periods of high prices or system stress. These arrangements can reduce exposure to peak prices, improve control over energy costs and create new revenue opportunities where flexibility can be sold back to the system. For the wider energy system, flexible demand can improve the utilisation of existing generation and network assets, reduce peak demand and defer the need for additional infrastructure investment.

Demand-side management value is greatest where energy use can be shifted or managed without materially affecting production with flexibility being commercially worthwhile and operationally practical, allowing energy users to participate where doing so improves both individual and system outcomes.

Energy efficiency is often described as the "first fuel" because the cheapest and lowest-emissions unit of energy is the one that does not need to be produced, transported or consumed. The IEA has recognised energy efficiency as one of the largest potential contributors to global decarbonisation. While New Zealand has significant renewable energy advantages, improving energy efficiency remains vital for improving productivity, reducing unnecessary costs on the system and accelerating decarbonisation objectives.

When energy is expensive, businesses have a strong financial incentive to find ways to improve energy efficiency. However, when energy is abundant and relatively affordable, the incentive to invest in efficiency can weaken, even if efficiency would still improve overall productivity and reduce system costs. For credible productivity improvements and greater international competitiveness, New Zealand should not be treating cheap energy and efficient energy use as substitutes but instead aim for both.

Many businesses face barriers to improving efficiency, whether that is a lack of capability, information or the resources to assess and implement upgrades. For businesses that face capital or time constraints, energy efficiency, which is not a core business function, may choose to prioritise other projects. While efficiency, can also reduce system-wide costs, these benefits may not be visible in private investment decisions. This could lead to underinvestment in efficiency even where national benefit is significant.

Energy efficiency therefore should be treated as a core productivity lever and this means embedding efficiency in national goals, setting clear targets, and ensuring policy settings encourage efficient energy use even in a future where prices fall significantly.

> Energy efficiency can improve productivity by allowing businesses and households to get more value from each unit of energy consumed

### Issue Two - Actions

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| Maintain currency of energy performance standards and ratings with latest technologies, so that, when households and businesses replace equipment, they have access to efficient technologies and clear information. |
| Support demand-side management through smart technology and contracting arrangements that help businesses shift or manage demand where this reduces costs, improves asset utilisation and lowers system pressure. |
| Expand guidance, voluntary audits, and information on energy systems optimisation for energy intensive firms, with a focus on helping businesses identify cost-effective efficiency opportunities, track performance and embed energy management into normal business decision-making.* |

** EECA already provides this service, this role can be expanded.*

# 4.2 Energy and Investment

## 4.2.1 Background

This section of the document does not address all areas of the sector where there are investment issues, nor is it intended to. Rather, it is to try and find the key areas where investment in energy is being impacted. There have been four issues identified touching on electricity supply, natural gas, emerging fuels, and energy demand. Existing engine fuels were not deemed to be an area where there are significant investment concerns.

The key issues identified are what is deemed most necessary to address.

## 4.2.2 Issue One
## Firm and flexible electricity supply

### Issue One - Problem Definition

The current electricity system is not delivering sufficient firm and flexible capacity, partly due to revenue uncertainty and limited long-term contracting.

### Issue One - Context

Building on the wider energy system context in section 3, this issue focuses on two firming challenges in New Zealand's electricity system:

**Dry year firming:** Ensuring enough supply (including fuel) and demand side resources over weeks to months when hydro output is reduced during extended or successive dry periods.

**Peak firming:** Ensuring sufficient supply and demand side resources during peak load periods when intermittent generation such as wind and solar is low or during times of system outages.

The firming challenge remains a feature of New Zealand's electricity system, but the context of addressing it has changed since the 2024 dry year. Recent developments, including the Huntly Strategic Agreement and Government investigation of LNG import options, may have helped reduce some near-term concerns around dry-year and fuel availability risk. Long-dated electricity futures prices have also fallen from the elevated levels seen during and after 2024. The rationale for this change is not understood fully but this indicates there may be less acute near-term scarcity risk than was perceived previously. However, this does not remove the underlying challenge, instead it changes the question of the last decade from whether the market can meet the scarcity problem of 2024, to whether it can deliver and retain the right mix of flexible, firm and long-duration resources needed to manage future weather, fuel and demand risk.

Thermal generation has traditionally provided firming for both dry years and peak demand, but this capability has declined due to a continued reduction in domestic gas supply and the decommissioning of around 1.2 GW of generation capacity since 2012. Increases in geothermal, onshore wind, solar, batteries, and industrial demand reduction have offset some of this loss, but the system continues to be exposed to cold, calm, dry winter periods when hydro, onshore wind and solar may all be constrained. The 2024 dry year demonstrated how low hydro inflows, weak onshore wind conditions, reduced thermal capability and fuel constraints can combine to create supply risk, high prices and impacts on industry.

Recent analysis, including the Frontier Report and Transpower's connection pipeline, shows new investment is

** The Government is currently pursuing LNG imports, which does represent a project in this space, but at the time of writing this report has not been confirmed.*

concentrated in wind, solar, geothermal and short duration batteries. This suggests the market is responding to renewable investment opportunities, with over 200MW of battery storage connected to the grid in the past three years and more in the pipeline. However, there are few new long duration, fuel stored or dispatchable generation projects.* As electricity demand grows through electrification and new loads the key issue is not simply whether investment is occurring, but whether the investment mix is sufficient to manage dry-year, peak demand, grid-stability, gas availability and ageing thermal plant risks.

As wind and solar capacity expands, low cost generation may increasingly displace hydro during some periods, leading to higher average storage levels and a greater role for hydro as the system's shock absorber. In the future, hydro is increasingly expected to provide flexible firming, alongside large scale batteries, shifting hydro away from baseload operation. This increases the importance of being able to operate the system in real time, and market rules and tools will need to evolve to support reliable peak supply. While dry year thermal firming will remain important, its role may reduce as renewables expand, raising market design challenges around maintaining adequate thermal capability and fuel under lower and more uncertain prices.

Transpower's draft 2026 Security of Supply Assessment highlights the need for follow-through on the current investment pipeline, timely project delivery, and sufficient thermal generation and fuel availability. Strengthening the pipeline of firm and flexible resources would reduce exposure to gas availability risks, ageing thermal plant, and support higher demand growth from electrification and new loads.

Maintaining a strong pace of renewable investment also remains critical. A diverse mix of generation technologies helps reduce exposure to correlated risks and supports affordability, reliability and sustainability. Ensuring the pipeline includes both energy and capacity resources—such as geothermal, batteries, flexible peaking generation and signalled demand response—is essential.

There has also been extensive work on contingent hydro storage access arrangements. The Business Energy Council believes there is potential for existing energy assets to be better utilised in the New Zealand energy market. For example, establishing clear and predictable triggers for accessing contingent hydro storage can assist with addressing a lack of firm and flexible supply. While improved access could enhance market certainty, it also involves trade offs, as easing access may increase system risks under highly stressed conditions.

The Government's 2025 Electricity Market Review concluded current market settings are unlikely to deliver sufficient dry year and firming capacity without change, citing high revenue uncertainty and weak investment incentives for firm, dispatchable supply.

## Issue One - Actions

Reviewing New Zealand's security standards to make sure these remain fit-for-purpose. For example, the Security Standards and Security Standards Assumptions Document (SSAD) last updated in 2012.

Explore what market and regulatory signals can support incentivising firm and flexible supply to support increased renewable uptake, increased demand growth and reduce exposure to downside risks (such as faster gas decline and ageing thermal generator availability).

Explore what longer-duration contracting mechanisms exist to improve investment certainty and improve system security.

Explore how existing energy resources, including hydro, can be better valued and utilised to improve security of supply.

Explore how alternative demand side technology and resources can be valued and accessed for providing flexibility in the energy system while ensuring economic output/activity is not curtailed or reduced.

Assess the future firming requirement under updated assumptions about renewable build, hydro storage levels and behaviour, demand growth, gas availability, thermal plant availability and demand-side flexibility.

# 4.2.3 Issue Two
# Long-term policy and transition certainty

### Issue Two - Problem definition

Unclear and inconsistent long-term policy and demand signals, particularly for gas and emerging fuels, are undermining investor confidence and preventing coordinated, large-scale investment across the energy system.

## Issue Two - Context

During this period of system transition, investors across the energy system are receiving mixed and, at times, contradictory signals about the future direction. Decisions such as the offshore oil and gas ban, discussions around large-scale interventions such as Lake Onslow, changing views on the future role of thermal generation and uncertainty around industrial demand have contributed to a perception of elevated sovereign and policy risk. While these interventions each had their own policy rationale, collectively they have increased uncertainty around long-term asset planning, future fuel demand and expected returns on investment.

This uncertainty is particularly significant for long-lived infrastructure and industrial assets, which often require investment horizons measured in decades. Therefore, confidence that policy settings, market frameworks and demand forecasts remain sufficiently stable over time is vital. Investors need clarity not only on the desired state of the energy transition, but also on the pathway to get there. At present, there is limited consensus on what the role of natural gas will continue to be in supporting electricity generation, industrial heat and system flexibility, or how quickly alternative fuels are expected to scale. This creates uncertainty across the entire value chain.

The absence of a clear transition pathway also creates coordination challenges between supply and demand. Emerging fuels often face a "chicken and egg" problem where producers require confidence in long-term customers before investing in supply, while potential customers are unwilling to commit until reliable and affordable supply is available. Similar dynamics exist for long-duration electricity investment and major industrial electrification projects, where uncertainty around future energy prices, infrastructure availability, and policy settings can delay or prevent investment decisions.

At a system level, this lack of long-term certainty is slowing the pace of investment required to achieve affordability, security, and sustainability simultaneously. It also reduces New Zealand's attractiveness for new industrial investment relative to competing jurisdictions with clearer energy strategies. While markets remain the preferred mechanism for investment decisions, credible long-term signals, clearer transition planning, and improved coordination mechanisms are increasingly likely to be required to support timely and efficient investment across the system.

A comprehensive and bipartisan energy strategy may be difficult to achieve in the near term, given continued disagreement over key issues. If a full strategy is not pursued, the priority should be to provide durable direction on the areas where uncertainty is most damaging to investment. The most immediate of these is the future role and availability of natural gas.

## Issue Two - Actions

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| Bipartisanship in long-term directional policy for key energy issues, with priority on the direction of the energy transition. If bipartisanship is not possible, look to depoliticise key energy issues though an entity such as the infrastructure commission. |
| Explore levers or signals that would assist investor confidence in either (or both) supply or demand side. |
| Continue to improve availability of information on fossil fuels in the short, medium and long term. |
| Continue to improve the availability of information on emerging fuels, including where they are likely to be most valuable and what barriers are preventing scale up. |
| Consider mechanisms that help bridge supply-demand coordination challenges, including offtake arrangements, aggregation of demand, or early-market support where justified. |

# 4.2.4 Issue Three Energy-user investment

### Issue Three - Problem definition

Weak incentives, capital constraints, and uncertain energy costs are limiting investment by energy users, constraining both decarbonisation and industrial growth.

### Issue Three - Context

The energy transition requires substantial investment in not only energy supply and infrastructure but also by energy users. Businesses across the economy are expected to pursue decarbonisation, maintain competitiveness, and respond to evolving consumer expectations. However, many firms face significant barriers to making these investments, slowing both decarbonisation efforts and industrial growth.

The potential commercial benefits of switching vary considerably between technologies and sectors. In some applications, particularly transport, electrification can deliver direct productivity gains. Light electric vehicles are generally more efficient at the point of use than internal-combustion vehicles and may reduce operating costs.* Electrification can also reduce exposure to international liquid-fuel price volatility and potential supply disruption.

However, these productivity benefits will depend on removing barriers to the uptake of EVs which includes the availability and reliability of charging infrastructure, electricity network capacity, a fair and streamlined system to pay for new connections and capacity upgrades, capital costs and coordination between the supply-side investment and demand-side uptake, all filtered through a lens of efficient build and operation of the infrastructure assets, and efficient utilisation by the consumer.

The electrification of industrial processes also has potential, but it is not as straightforward as transport and poses technical challenges for high-temperature applications. While some processes are suitable for electrification, many firms face high upfront costs, uncertain electricity prices and network constraints. Electrification may reduce emissions and, in some cases, improve operating efficiency, but it does not always deliver immediate productivity gains.

The risk is not only that new growth is delayed but that existing industrial capability is lost. Affordability pressures have already contributed to deindustrialisation pressures. This creates a wider economic risk because energy intensive industries often supply critical inputs to the rest of the economy, including construction materials such as concrete, bitumen, lime and others. If energy costs are not well managed, these input costs can flow through into higher building and infrastructure costs, weakening competitiveness and making future investment more difficult.

One of the most significant constraints is the capital intensity of decarbonisation. These investments are lateral in nature, replacing existing equipment or fuel sources without materially improving productivity or output. Unlike investments that directly expand production or revenue, decarbonisation projects can compete against core business investments with clearer commercial returns, in a capital constrained/competitive environment, these projects can struggle to secure funding even where long-term emission or operational benefits exist.

Uncertainty around future energy costs and availability further compounds this challenge. Businesses considering electrification or fuel switching must make long-term decisions based on uncertain electricity pricing, transmission/distribution capacity, gas price and supply outlooks, and carbon prices. In sectors exposed to international competition, concerns about energy affordability and reliability can discourage investment altogether or shift investment offshore to jurisdictions perceived as offering lower energy costs or greater clarity.

Capability constraints are also a growing issue, particularly for small and medium-sized enterprises (SMEs). Many SMEs lack the in-house expertise, operational capacity, or time required to assess decarbonisation opportunities, or develop credible energy and/or transition plans. While programmes such as those provided by EECA support some businesses through advisory and co-funding schemes, support is often limited.

** W. Achariyaviriya, W. Wongsapai, D. Rinchumphu, N. Tippayawong, K. Y. Tippayawong, P. Suttakul, A comparative study of vehicle powertrain efficiency: data-driven analysing energy consumption and environmental impact. Transportation Engineering. Volume 8. 2024.*

At the same time, NZ faces questions about its future industrial competitiveness and strategic economic positioning. Opportunities for new industrial development such as data centres, advanced manufacturing, low-emission processing, or strategic domestic production will depend on access to reliable and internationally competitive energy. Long-term contracting arrangements, which can provide certainty for both energy suppliers and industrial users, remain relatively underdeveloped in New Zealand compared with some international markets. This may limit the ability of both generators and large users to support major investment decisions.

Alternative and renewable fuels also have a role where electrification is technically difficult, expensive or unsuitable. Biomethane, biogas, biomass, low-carbon liquid fuels and hydrogen could supplement declining natural gas supply and support hard-to-electrify industrial processes and transport applications. However, many of these pathways remain commercially immature, relatively high cost and constrained by uncertain demand, limited infrastructure and undeveloped supply chains.

The challenge is therefore not simply to encourage energy users to electrify or switch fuels. It is to remove avoidable barriers and create the conditions in which users can identify and pursue commercially credible opportunities, while recognising that some investments may require coordination or support where wider economic and system benefits are not adequately reflected in private returns.

The challenge is therefore not simply to encourage energy users to electrify or switch fuels. It is to remove avoidable barriers and create the conditions in which users can identify and pursue commercially credible opportunities.

## Issue Three - Actions

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| Assess the effectiveness of the gas transition loan underwriting scheme and consider whether adjustment is needed if businesses are still unable to switch. |
| Improve long-term certainty around energy and carbon pricing, including greater stability and predictability within the ETS. |
| Standardise and streamline the regulatory, consenting and pricing requirements applied by local partners to public charging connections, reducing regional inconsistencies that currently make uniform national rollout slower, more complex and more costly. |
| Continue to explore mechanisms that improve investment certainty for both users and suppliers, including longer-duration contracting arrangements such as PPAs and other supply agreements. |
| Assess barriers to long-term energy contracting in New Zealand and whether changes to market structures or commercial practices could improve uptake and investment confidence. |
| Expand access to advisory, capability building, and technical support for businesses undertaking decarbonisation planning and investment. |
| Explore whether existing policy and funding settings adequately recognise the wider system and economic benefits of industrial decarbonisation and preventing deindustrialisation. |

# 4.2.5 Issue Four
# Network investment and coordination

### Issue Four - Problem definition

Electricity network investment and system development are not sufficiently coordinated or forward-looking, with current planning, cost allocation, and investment frameworks limiting the ability to enable generation, demand and innovative network solutions at the scale and timing required.

### Issue Four - Context

Electricity transmission and distribution is critical to New Zealand's energy transition as electrification, decarbonisation, and renewable generation accelerate. Like many countries, New Zealand faces long lead times for new transmission, which the International Energy Agency identifies as a global challenge. New transmission lines typically take 7–10 years to plan and deliver which is longer than most generation projects. This creates a risk that transmission could constrain, rather than enable, growth and decarbonisation.

Although New Zealand has not commissioned a major new transmission line for over a decade, new build will be required to meet expected future increases in electricity demand. Generation, transmission and demand must coordinate. This will require consideration as to locations and to how planning and approvals, investment and regulatory settings and funding and delivery constraints can improve the pace at which transmission build can be an enabler.

For example, transmission consenting and planning can take 3-7 years. It is common overseas to face opposition to new transmission infrastructure by local communities, which can lengthen environmental and planning approvals. Transmission requires securing rights across many privately owned parcels of land, which can create complex time-consuming negotiations, particularly where compensation arrangements, landowner rights and acquisition processes are less standardised than other infrastructure such as roads or international models for compensation.

Transpower recognises that transmission is long lead infrastructure, requiring planning and investment many years ahead of need, which is why it is developing a 30 year grid blueprint to reflect the long timeframes to plan, consent and deliver major transmission infrastructure. However, current regulatory settings require a high degree of confidence in future demand or generation before transmission investment can be approved. In practice, this means major transmission upgrades are typically progressed only when generation or load projects are sufficiently advanced toward final investment decision, limiting the ability for transmission to be built ahead of demand.

Current regulatory frameworks favour just in time investment for both transmission and distribution, requiring high confidence in future demand before investment is committed. While this reduces underutilisation risk and cost for consumers, it can delay wider economic and decarbonisation benefits. Transpower is seeking to address this through longer term planning and testing more enabling approaches, including via a Major Capex Proposal investigation in the Tararua–Wairarapa region.

> Electricity transmission and distribution is critical to New Zealand's energy transition as electrification, decarbonisation, and renewable generation accelerate.

## Issue Four - Actions

Monitor and evaluate the Tararua–Wairarapa transmission investigation as a live test case to identify lessons on coordination, regulatory settings, cost allocation, and approval processes, and to inform whether changes are needed to better support timely and coordinated transmission investment.

Continue to develop a future-focused transmission network blueprint to guide investments in national electricity transmission infrastructure up to and beyond 2050.*

Improve coordination across transmission, distribution, generation, and major demand planning by creating an investment development map that identifies areas in the network where demand and generation projects are underway and where further opportunities may exist for investment, so network capacity is better utilised and grid infrastructure is developed to enable it.

Consider whether alternative enabling focused funding and cost allocation arrangements, such as the Government's funding for the ultra-fast broadband roll-out could enable better outcomes.

Investigate options for incentivising collaboration or consolidation for EDBs (such as the IRIS period for efficiency benefits, or how transaction costs are treated).

Adjust regulatory settings to promote non-network solutions and distribution system operator capability, for example incentivising higher risk opex solutions or treating this opex differently, review quality standards to suit changing reliability expectations, or enable dynamic pricing.

** Te Kanapu workstream is already underway.*

## 4.3 Future Opportunities

### 4.3.1 Turning New Zealand's advantages into investable outcomes

As mentioned previously in this paper, New Zealand has been blessed with a wide array of energy inputs, which are our natural advantages. These include a highly renewable electricity system, geothermal resources, hydro flexibility, biomass and biogenic carbon, critical minerals, existing fuel infrastructure, and strong technical and institutional capability. However, these advantages do not guarantee success, nor do they automatically become economic opportunities.

The same underlying inputs can lead to very different outcomes depending on how they are used, coordinated and prioritised. If New Zealand's energy advantages continue to be developed in an uncoordinated way, a risk continues that scarce resources are allocated to lower value uses, existing industries are crowded out, infrastructure costs are poorly allocated, and opportunities fail to build durable domestic capability.

There are levers that can be applied to determine how resources available can be converted into investable outcomes for New Zealand.

These include but are not limited to:

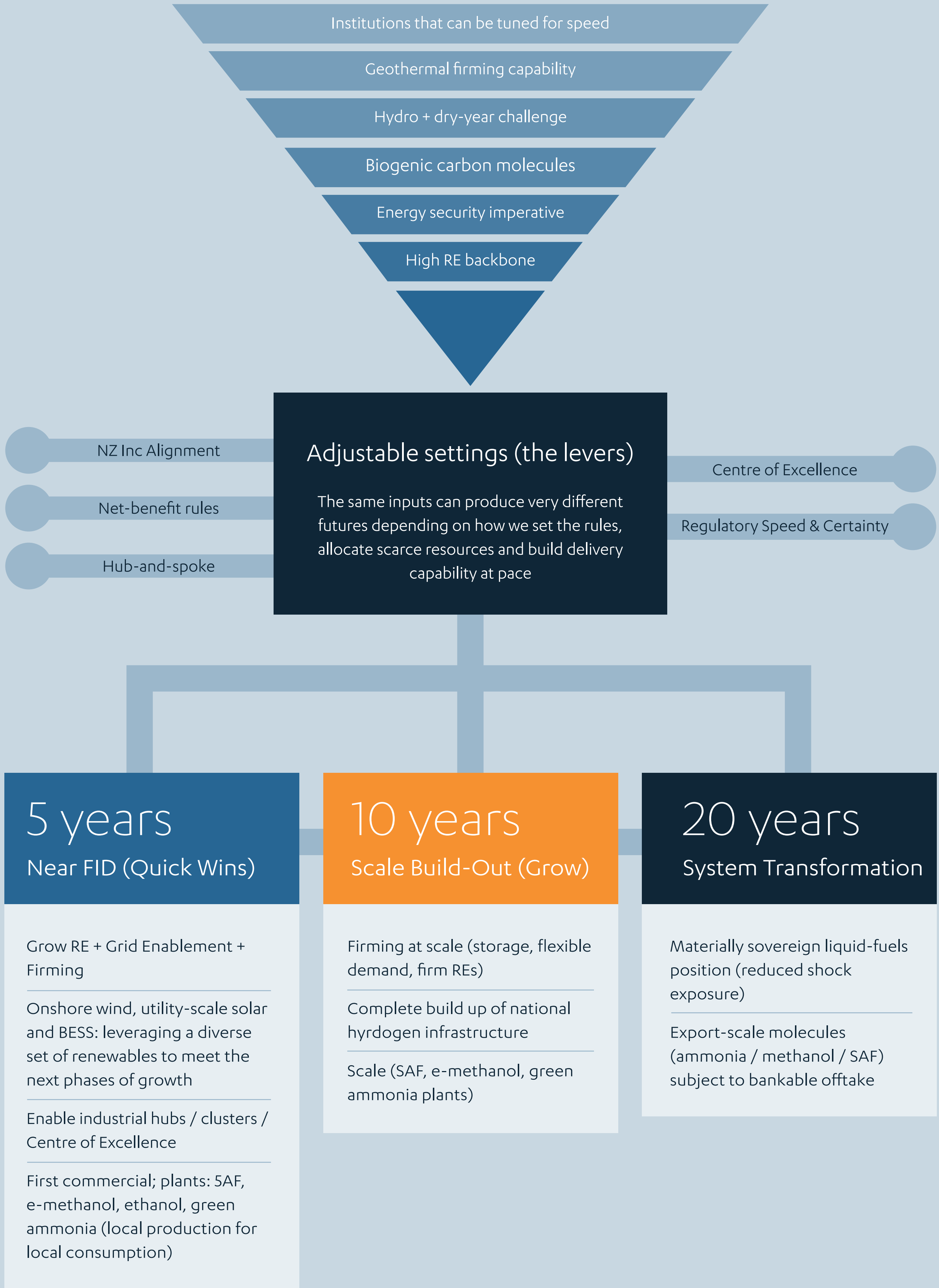
- **NZ Inc alignment:** allocation of scarce inputs
- **Net-benefit rules for new load:** additionality, flexibility, local value, cost causation
- **Hub-and-spoke/industry clusters:** local production for local consumption; avoid single-project concentration risk
- **Centres for excellence and regional hubs:** skills, delivery capability, replicable models
- **Regulatory speed and durability:** consenting, connections, cost allocation, investor clarity

These levers sit between New Zealand's natural advantages and the outcome we ultimately achieve. They help determine whether energy resources are used only to meet immediate demand, or whether they are converted into enduring economic capability, resilience and competitive advantage.

This relationship is illustrated in the diagram overleaf.

> New Zealand has been blessed with a wide array of energy inputs, which are our natural advantages...However, these advantages do not guarantee success.

# One Possible Future Scenario



## 4.3.2 Applying an NZ Inc Net-Benefit Lens

Major energy projects can create benefits and costs that extend beyond the direct interest of the project developer. Where investment into new energy projects requires regulatory approval, they should be considered for fast-track approval if they provide spill over benefit, including:

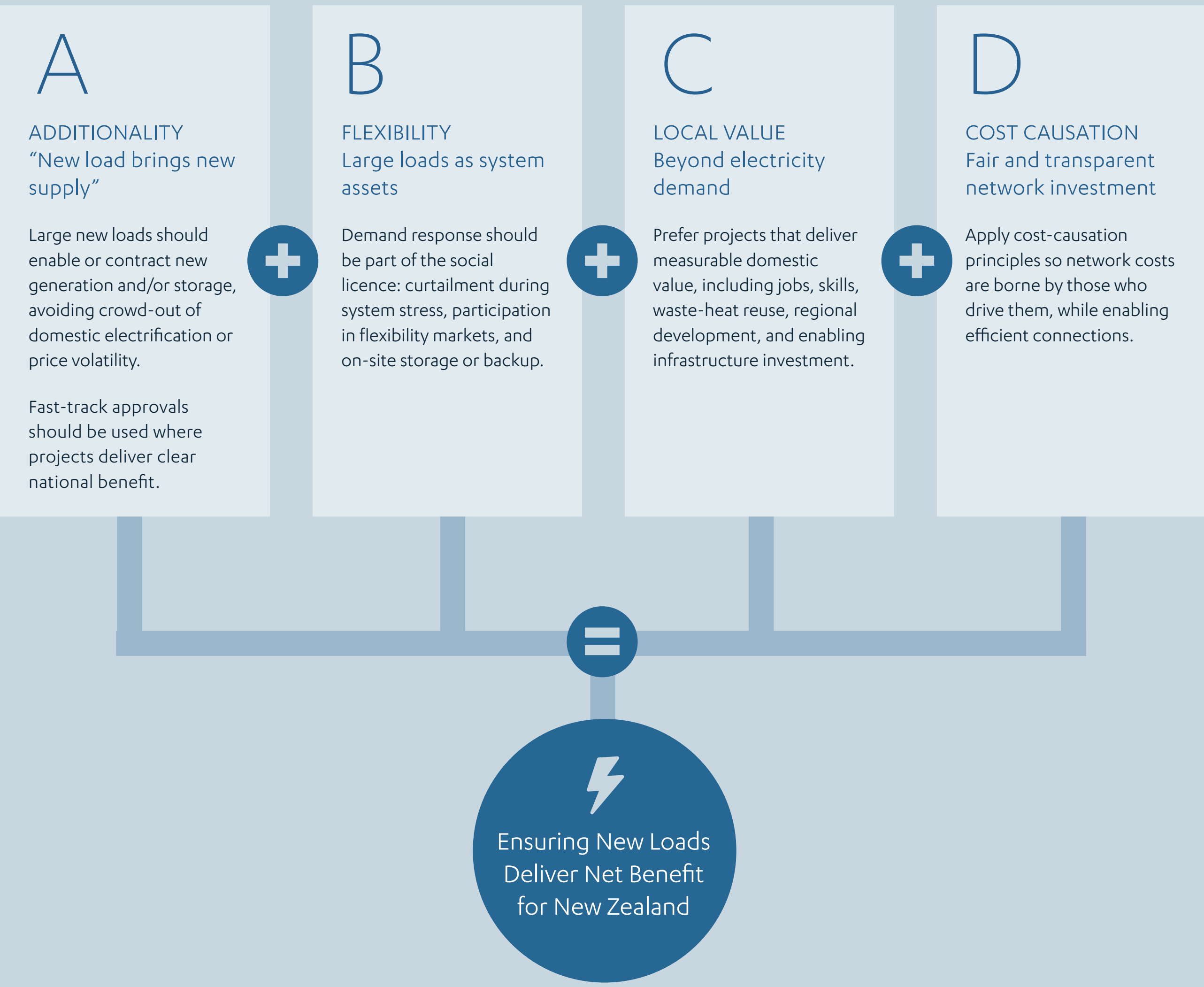
**Additionality:** whether a project contributes to new supply, firming, flexibility, infrastructure or capability, rather than relying on existing scarce resources.

**Flexibility:** whether a project can support system resilience through demand response, storage, flexible operation or other system services.

**Local value:** whether the project creates durable value in New Zealand, including jobs, skill, regional development, industrial capability or export potential.

**Cost causation:** whether the infrastructure and system costs created by the project are fairly allocated to those who drive them.

NZ should welcome energy intensive investment, especially where it brings new supply and firming, provides flexible demand that strengthens resilience, delivers measurable domestic value. The goal is not to discourage growth, but to ensure growth benefits New Zealanders.



The following "big plays" represent the opportunity available if New Zealand can convert its energy advantages into secure, affordable and investable outcomes.

They are not intended to be a complete list of all opportunities rather they are meant to be a short list of key areas where we believed New Zealand has a credible advantage. Each big play relies on the same conditions, reliable and competitively priced energy, sufficient infrastructure and clear long-term signals.

## 4.3.3 Big Play One: Secure Electrification

### Big Play One - Opportunity

Secure electrification, firmed renewables as New Zealand's growth engine.

### Opportunity definition

The opportunity is to convert New Zealand's highly renewable electricity system into a secure, reliable and investable platform for economic growth. This means moving beyond a focus on renewable share alone, towards a system where renewables can reliably support large-scale electrification, industrial growth, e-fuels and new energy-intensive demand.

Secure electrification is the foundation for many of New Zealand's wider opportunities. If electricity can be delivered affordable and reliable, it will help decarbonise transport and industrial heat, support existing exporters, attract new productive investment, and enable emerging sectors that require low-emissions energy at scale.

### Why NZ has a credible advantage

New Zealand already has a strong renewables base, as discussed at length throughout this paper. This gives us a head start compared to jurisdictions still trying to decarbonise fossil-heavy electricity systems. The distinctive opportunity is not simply that this renewable electricity base exists but that we have the potential to access a combination of flexible hydro, firm geothermal, batteries, demand response, flexible load and system operating expertise to secure a low-emissions, secure, electricity platform.

If developed well, this could make reliable renewable electricity a source of competitive advantage for New Zealand, particularly for sectors where energy security, low emissions, and long-term price confidence are increasingly important.

### What would need to be true to achieve this opportunity

New Zealand has sufficient firming, flexibility, storage and demand-side capability to support high levels of electrification.

Renewable electricity growth is matched with timely network, firming and flexibility investment.

Electricity remains internationally competitive and affordable enough to support industrial growth and fuel switching.

Market, regulatory and operational settings support confidence in reliable low-emissions cost-effective electricity supply.

Energy users have confidence that electrification decisions are durable, commercially viable and aligned with the long-term direction of the system.

### Big Play One - Key barriers

Risk that electricity demand grows faster than firming, flexibility and network capability.

Revenue uncertainty for firm and flexible resources, which may limit investment confidence.

Network constraints and long lead times for connecting new generation and demand.

Uncertainty for large energy users around future electricity prices, contracting options and infrastructure availability.

Potential social licence concerns if new large loads are seen to compete with households or existing industry for scarce energy capacity.

Limited mechanisms to ensure new demand contributes to system resilience rather than simply adding pressure.

## Big Play One - Potential actions

Ensure electricity market and regulatory settings support investment in firmed renewable supply, flexibility and demand response at affordable prices.

Improve coordination between renewable generation, networks, firming resources and major new demand.

Apply a net-benefit lens to resource consenting, fast-track approvals and enabling infrastructure, including additionality, flexibility, local value and cost causation.

Support long-term contracting mechanisms that provide confidence for both electricity suppliers and large energy users.

Enable demand-side flexibility and distributed resources to contribute to system reliability without unnecessarily reducing economic output.

Ensure electrification pathways for transport, process heat and industry are aligned with electricity supply, network and firming capability.

## Big Play One - Priority level

**HIGH PRIORITY** - near-term and long-term

Secure electrification is a high-priority opportunity because it underpins many of the other opportunities identified in this report. Without reliable, affordable and firmed renewable electricity, New Zealand will struggle to decarbonise industry, support transport electrification, enable future fuels, attract new energy-intensive investment or turn energy into a durable competitive advantage.

In the near term, the focus should be on ensuring electrification is supported by firming, networks and flexible demand. Over the longer term, secure electrification can become a platform for industrial growth, export competitiveness and future energy-enabled opportunities.

# 4.3.4 Big Play Two: Upgrade the Export Base

### Big Play Two - Opportunity

Industrial value capture, using energy advantage to deepen New Zealand's export base

## Opportunity definition

The opportunity is to ensure secure, competitively priced and increasingly low-emissions energy retains, strengthens and deepens New Zealand's productive industrial base. This is not only about helping existing exporters decarbonise, rather it is about using energy as a platform for more domestic processing, higher value exports, supply-chain resilience and long-term industrial capability.

New Zealand already has strengths in food, fibre, wood, and materials. With abundant energy New Zealand could move more of these sectors up the value chain, rather than allowing high energy costs, infrastructure constraints or transition uncertainty to push processing offshore or lock New Zealand into exporting raw or lightly processed inputs.

Decarbonisation fits inside this wider industrial upgrade agenda. Secure and low-emissions energy can help existing exporters protect market access, reduce exposure to fuel and carbon volatility, improve productivity, and create higher-value products that are linked to New Zealand's established global strengths, high quality production with secure, low-emissions energy and sustainable practices.

## Why NZ has a credible advantage

New Zealand has a credible foundation for this opportunity because we already have an established export base, a strong reputation for high-quality production, and a comparatively renewable electricity system. These advantages mean New Zealand does not need to build an industrial base from scratch, although it needs to be recognised that this base has been reducing in recent years. The opportunity is to reverse this decline and deepen and strengthen the productive sectors already present in the economy.

New Zealand historically benefited from access to comparatively affordable energy. This helped attract and retain energy-intensive activity and supported the development of processing, manufacturing and export industries. Internationally competitive energy prices will be central to whether these industries continue to invest, expand and remain in New Zealand. As well as new industries such as data centres, film and gaming.

There is also a potential reinforcing "flywheel" effect. Competitive energy can lower input costs and support domestic processing. Domestic processing can create higher-value exports. Higher-value exports can strengthen business resilience and justify further investment in energy productivity, decarbonisation and innovation. If managed well, these elements can reinforce each other and turn energy advantage into export advantage and enhance New Zealand's absorbative economic capacity.

New Zealand's global reputation for quality, sustainability and trusted production also provides a platform for differentiation. However, this reputation will only create enduring value if it is backed by reliable production, competitive input costs and credible low-emissions pathways.

## What would need to be true to achieve this opportunity

New Zealand maintains internationally competitive energy prices, so exporters and industrial firms have reason to continue operating, investing and expanding domestically.

Energy supply is secure and reliable enough to support industrial production, processing and long-term investment decisions.

Firms have confidence around future electricity prices, gas availability, carbon costs, infrastructure access and decarbonisation expectations.

Energy infrastructure is available in the regions where processing, manufacturing and export activity occurs.

Exporters are able to access practical and commercially viable pathways for energy efficiency, electrification, fuel switching and process improvement.

Domestic processing and manufacturing are commercially attractive compared with exporting raw or lightly processed inputs.

The workforce and skills pipeline can support higher-value processing, manufacturing, energy management and industrial innovation.

## Big Play Two - Key barriers

High or volatile energy costs can reduce competitiveness for trade-exposed firms that cannot pass costs through to international customers.

Infrastructure constraints, including electricity network capacity, gas uncertainty and transport limitations, can make domestic processing harder to justify.

New Zealand's distance from export markets creates freight and logistics costs that can disadvantage manufacturers unless input costs and productivity remain competitive.

Many existing industrial sectors still rely on gas, coal, diesel or other liquid fuels, meaning transition will require significant capital investment and operational change.

Uncertainty around energy prices, carbon prices and policy direction can delay or reduce investment in domestic processing and decarbonisation.

Some firms may continue exporting raw or lightly processed inputs if the commercial case for domestic value-added production is uncompetitive within the international market.

Domestic manufacturers face competition from imports that do not face equivalent carbon, energy or regulatory costs.

The wider national value of retaining industrial capability, regional employment and supply-chain resilience is not fully reflected in individual firm investment decisions.

## Big Play Two - Potential actions

Assess where energy costs, infrastructure constraints or transition uncertainty are creating risks of deindustrialisation, reduced investment or movement of processing offshore.

Align energy infrastructure planning with major export and processing regions, including electricity networks, gas transition planning, industrial heat requirements and future low-emissions fuel options.

Investigate whether trade-exposed domestic manufacturers face an uneven playing field from imports that do not face equivalent carbon or energy costs. If they do then which ones and to what extent.

Prioritise value-added processing and manufacturing where New Zealand has credible advantages in energy, feedstock, capability, provenance or market access.

Consider targeted support where retaining or upgrading industrial capability delivers wider national benefits, such as regional employment, supply-chain resilience, critical materials, infrastructure utilisation or emissions reduction, without offshoring production.

Link a potential energy strategy more deliberately with trade, regional development, industrial capability and skills policy, so energy is treated as an enabler of export growth rather than only an input cost or emissions challenge.

## Big Play Two - Priority level

**HIGH PRIORITY** - near-term to medium-term

Upgrade the Export Base is a high-priority opportunity because New Zealand's existing export industries are already central to national income, regional employment and industrial capability. Unlike opportunities that depend on entirely new industries emerging, this opportunity builds from sectors where New Zealand already has firms, skills, assets, market relationships and global recognition.

In the near term, the focus should be on ensuring energy costs, infrastructure constraints and transition uncertainty do not weaken existing productive capability. Over the medium term, the opportunity is to use secure and competitive energy to support more domestic processing, higher-value exports and stronger low-emissions market positioning.

# 4.3.5 Big Play Three: Fuel Resilience & Security

### Big Play Three - Opportunity

Strengthening fuel security and reducing exposure to global liquid-fuel shocks

## Opportunity definition

The opportunity is to treat liquid-fuel security as critical national infrastructure and a core component of New Zealand's national security, while developing credible domestic and/or regional pathways to reduce New Zealand's exposure to global fuel supply shocks over time.

New Zealand will continue to rely on petrol, diesel, jet fuel, shipping fuels and other liquid fuels for essential economic activity, particularly in freight, agriculture, aviation, construction, tourism and emergency services for several decades. While the uptake of alternative technologies and fuels such as electric vehicles, low carbon liquid fuels and hydrogen will reduce demand over time, some sectors will remain difficult to transition. Fuel security therefore means ensuring reliable access to essential fuels during disruption, including through regional partnerships, while building alternative pathways such as hydrogen, sustainable aviation fuel, e-methanol, ammonia and other alternative fuels where they are credible and commercially viable.

## Why NZ has a credible advantage

New Zealand's advantage is not that it can become fully self-sufficient in all liquid fuels in the near term, but it can build a more resilient, diversified and regionally connected fuel system over time. New Zealand also has foundations for reducing strategic exposure.

These include a highly renewable electricity system that can support some green fuel pathways, biomass and biogenic carbon resources relevant to sustainable fuels, existing industrial and logistics demand, opportunities to participate in regional supply chains and partnerships, and growing interest in renewable fuel infrastructure. New Zealand's geographic isolation also creates a strong strategic rationale for treating fuel resilience and liquid-fuel transition as national priorities.

The opportunity is to move from dependence on imported fuels toward a more resilient and diversified system that combines efficient industry and crown fuel storage, robust import arrangements, electrification where practical, and domestic or regional production of alternative fuels where this delivers net benefit and are cost effective.

## What would need to be true to achieve this opportunity

New Zealand has a clearer view of which liquid fuels will remain essential, for which sectors, and over what timeframe.

Fuel security settings are calibrated to avoid both under-resilience and costly overbuild.

Electrification reduces liquid-fuel dependence where it is technically and economically practical.

Alternative fuel pathways are explored where New Zealand has credible feedstocks, demand, infrastructure and cost advantages.

Domestic or regional production opportunities are linked to real offtake demand, not speculative supply.

Fuel resilience planning is coordinated across transport, electricity, industry and emergency management due to its national security importance.

## Big Play Three - Key barriers

Continued reliance on globally traded fuels means New Zealand remains exposed to international supply disruption and price volatility.

Many alternative fuels remain commercially immature or high cost.

Demand certainty is weak, making it difficult for producers to invest in new fuel supply chains.

Feedstocks such as biogenic carbon, biomass, renewable electricity and suitable industrial sites may be scarce or contested.

Infrastructure requirements for alternative fuels, including storage, transport, refuelling and port facilities, are significant.

There is a risk of backing pathways that do not become commercially viable or do not deliver sufficient domestic value.

## Big Play Three - Potential actions

Clarify New Zealand's long-term liquid-fuel security and resilience requirements, including the role of industry and crown in stockholding, cost sharing, import arrangements, demand reduction and alternative fuel production.

Identify which sectors are likely to remain dependent on liquid fuels for the longest, such as aviation, shipping, heavy freight, agriculture and emergency services.

Develop a credible pathway for alternative fuels, based on net benefit to New Zealand, where cost effective.

Assess where domestic or regional supply chains & further partnerships could improve resilience, reduce exposure to fuel shocks, and enable shared industrial development.

Use a net-benefit lens to prioritise projects that create local value, strengthen resilience, use scarce input efficiently and fairly meet the costs they impose.

Support early offtake, infrastructure planning and aggregation of demand where this can help commercially viable fuel pathways scale.

Ensure fuel transition planning is coordinated with electrification, electricity system security, transport infrastructure, regional development and national security arrangements.

## Big Play Three - Priority level

**HIGH PRIORITY** - medium to long-term, with near-term resilience actions

Fuel security is a high-priority opportunity as liquid fuels remain critical to New Zealand's economy and national security, and because exposure to global fuel shocks will not disappear quickly. In the near term, the focus should be on resilience measures, stockholding, import security, regional partnerships and reducing avoidable demand. Over the medium to long term, the opportunity is to build credible alternative fuel pathways that reduce strategic exposure while supporting domestic value creation and future industrial capability.

# 4.3.6 Big Play Four: Delivery Hubs and Capability

## Big Play Four - Opportunity

Delivery hubs and capability, turning energy advantage into repeatable industry outcomes.

## Opportunity definition

The opportunity is to create regional energy-enabled industrial hubs that bring together local energy resources, feedstocks, infrastructure, skills and demand so that projects become easier to finance, faster to deliver and more valuable to New Zealand.

Rather than treating each energy project as a standalone development, this approach would deliberately coordinate energy supply, feedstock, infrastructure, and demand. The aim is to reduce project risk, aggregate demand, make better use of enabling infrastructure and build repeatable models that can support local production, industrial growth, regional resilience and export capability.

This opportunity is also about building delivery capability. New Zealand may not be able to compete globally on scale alone, but we can compete on the ability to integrate firmed renewables, geothermal, green molecules, industrial decarbonisation, local partnerships and social licence into real-world projects. Overtime successful hubs could become centres of excellence, turning practical experience into exportable skills, standards, operating models and expertise.

## Why NZ has a credible advantage

New Zealand has several features that support a hub-based approach. These include strong renewable and geothermal resources, regional concentrations of industrial demand, biomass and biogenic carbon resources, existing energy and transport infrastructure, and experience delivering complex energy projects.

Some regions already have natural combinations of energy resources, feedstock and demand. Geothermal regions, forestry regions, ports, in-land ports, freight corridors and industrial processing centres could each support different types of energy-enabled hubs. By aligning these strengths, New Zealand can move from isolated project development toward coordinated regional delivery.

New Zealand also has an opportunity to build a recognisable national capability in energy transition execution. This could include system integration, firmed renewables, geothermal development, green molecules, industrial heat decarbonisation, regional partnership models, and practical delivery of energy-enabled industry.

## What would need to be true to achieve this opportunity

Priority regions are identified where energy resources, feedstock, infrastructure and industrial demand already overlap.

Hubs are designed around credible anchor projects and real demand, not speculative supply.

Energy production is right-sized to local or regional demand, rather than over-scaled for single-use projects.

Local production for local consumption is prioritised where it improves resilience and strengthens regional economies.

Enabling infrastructure, including electricity networks, storage, transport, ports, refuelling or processing infrastructure, is planned in a coordinated way and cost allocations align with real benefits that are being delivered.

Iwi, local government, industry, infrastructure providers and central government are aligned around clear regional opportunities.

Skills, workforce development and capability-building are treated as core parts of hub development.

Lessons from early hubs are captured and turned into repeatable models for other regions.

## Big Play Four - Key barriers

Energy projects are often developed individually, without sufficient coordination with local demand, infrastructure, feedstock or workforce planning.

Emerging fuel and industrial decarbonisation projects can struggle to secure bankable offtake.

Scarce inputs such as biomass, biogas, biogenic carbon, network capacity, suitable land, skilled labour and infrastructure access may become contested.

Over-scaled or single-use projects can create concentration risk if demand does not materialise.

Consenting, connection and regulatory processes can delay project delivery.

There may be limited clarity on which regions or sectors should be prioritised first.

Coordination between central government, councils, iwi, infrastructure providers, energy developers and industrial users can be difficult.

New Zealand risks exporting raw or lightly processed inputs rather than capturing higher-value processing and manufacturing opportunities domestically.

## Big Play Four - Potential actions

Identify a small number of priority regions where energy resources, feedstock, infrastructure and industrial demand create credible hub opportunities.

Map local energy supply, network capacity, feedstocks, industrial users, transport links, ports, skills and consenting constraints in each priority region.

Identify anchor projects that could support hub development, such as geothermal industrial heat, biomass or biogenic carbon use, hydrogen freight corridors, sustainable fuel production, or firmed renewable electricity for industrial load.

Aggregate demand and offtake across multiple users to improve the commercial case for emerging fuels, shared infrastructure or industrial decarbonisation projects.

Apply the NZ Inc net-benefit framework to proposed hubs, including additionality, flexibility, local value and cost causation.

Support skills and workforce development linked to identified hub opportunities.

Improve coordination between central government, local government, iwi, infrastructure providers, energy developers and industrial users.

Use regulatory speed and certainty to support hubs that demonstrate clear regional or national benefit.

Capture lessons from early hubs and develop repeatable commercial, regulatory and partnership models that can be applied elsewhere.

Explore how New Zealand can export delivery capability, including skills, standards, operating models and project expertise.

## Big Play Four - Priority level

**MEDIUM** - near-term to long-term

This opportunity is important because it provides a practical model for turning energy advantage into real projects. In the near term, the focus should be on identifying credible regions, mapping opportunities and developing anchor projects. Over the medium to long term, successful hubs could build regional resilience, support industrial growth, create domestic value from local resources and develop exportable capability.

The opportunity is less about any single technology and more about execution. New Zealand's long-term energy advantage may depend not only on the resources we have, but on our ability to coordinate, deliver and replicate investable outcomes.

# 5. Conclusion

# Section 5: Conclusion

## This report has been written under the premise, as identified in the BusinessNZ Future Vision document, that energy can be one of New Zealand's long term competitive advantages.

Energy sits at the centre of some of our country's most important long-term choices. It is an enabler of a productive economy, affects the cost of doing business, the competitiveness of exporters, the viability of industry and the credibility of New Zealand's emissions reduction pathway. The central message of this report is that New Zealand cannot afford to simply treat energy as a sector to be decarbonised, but as a platform that supports long-term national prosperity.

We have discussed that New Zealand has real energy advantages. A highly renewable electricity system, significant geothermal, hydro, wind and bioenergy resources, and technical and institutional capability provide a strong backbone. However, these advantages are not guaranteed to enable energy to be a long-term competitive advantage for New Zealand. This will only be the case if we are able to convert them into reliable, affordable, and investable outcomes.

Under the productivity, investment and future opportunities workstreams, several common messages emerge. Energy must be competitively priced against our international peers if industrial investment and export competitiveness are to be consolidated and grown. Long-term regulatory stability is needed by both energy suppliers and energy users to make capital intensive investments. Firming, flexibility, network capacity and demand side participation will be central to maintaining security of supply as electricity demand grows. Emerging fuels have an important part to play in the transition where electrification is not viable.

The group also surfaced that coordination now matters more than ever. Many of the opportunities identified in this report sit between or across multiple parts of the energy system, electricity, gas, liquid fuels, transport, industry, networks and more. Decisions made in one part of the system increasingly affect outcomes in others. To avoid unintended consequences, duplication, stranded assets or the loss of productive industrial capability, we must have stronger coordination. This does not mean replacing markets or centrally planning the energy system. Markets remain essential for efficient investment and commercial decision-making.

The NZ Inc perspective is also important. As demand grows, some inputs will become scarce if action is not taken, including firm electricity supply, network capacity, skilled labour etc. These resources should be allocated in ways that maximise national value, rather than supporting projects in isolation. A net-benefit approach could help ensure that new demand and new investment contribute to additionality, flexibility, local value, fair cost allocation and social licence. The challenge is to achieve this net-benefit within the competitive market structure.

Ultimately the challenge that New Zealand faces is not whether or not we have the energy advantages needed, it is whether those advantages can be converted into higher productivity, stronger industrial capability, greater resilience, decarbonisation and economic opportunity. If we can maintain affordable and secure energy, coordinate investment ahead of need, support productive energy use and focus scarce resources on opportunities that maximise value, energy can become a defining feature of our economic future and an enabler of improved prosperity.

# About BEC

The BusinessNZ Energy Council (BEC) is a group of leading energy-sector business, government and research organisations taking a leading role in creating a sustainable, equitable and secure energy future.

BEC is a brand of BusinessNZ and represents the World Energy Council in New Zealand. Together with its members, BEC is shaping the energy agenda for New Zealand and globally.

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## How do we add value?

# Annex One

## Cost of carbon in the electricity system

Estimate of the actual carbon cost burned

**NZU ~ NZ$45/TCO2**

Thermal gen emissions intensity, source: eaf-review-background-information-report.pdf

**GAS ~ 0.5 TCO2/MWH**

**COAL ~ 0.9 TCO2/MWH**

**Using gas as the common marginal plant:**
0.5 × 45 = 22.5 NZD/MWh

**Using coal as the common marginal plant:**
0.9 × 45 = 40.5 NZD/MWh

So, depending on the marginal cost setter the ETS roughly adds between 22.5 and 40.5 NZD/MWh.

In 2024 thermal gen made up 6.325 TWh. Electricity statistics | Ministry of Business, Innovation & Employment

So total annual emission cost is between (6,325,000 MWh x $22.5 =) $142,312,500 and (6,325,000 MWh x $40.5 =) $256,162,500.

**~NZ$150-250 MILLION/YEAR**

In 2024 NZ generated 43.872 TWh of electricity. Electricity statistics | Ministry of Business, Innovation & Employment

BCG report showed that wholesale is set by thermal up to 90% of the time (even at 95% renewable it will price set 50-60% of the time). Energy to Grow: Securing New Zealand's Future

**Note:** even when thermal generation is not the marginal price setter hydro is influenced by the cost of thermal generation.

Based on the above, estimate that wholesale is elevated by between 20-35 NZD/MWh due to cost of carbon.

**LOW ESTIMATE = 43,872,000 × 20 = $877,440,000**

**HIGH ESTIMATE = 43,872,000 × 35 = $1,535,520,000**

So, an estimate of system-wide wholesale price effect of carbon price could be NZ$ 800 million – NZ$ 1.5 billion/year.

The system could be paying between NZ$600 million – NZ$1.25 billion a year more than the actual value of carbon.