Aotearoa's Energy Future

Practical Pathways Beyond LNG

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Executive summary

New Zealand's energy system is entering a period of structural change.

The domestic natural gas supply is declining faster than previously expected. At the same time, gas remains embedded across multiple parts of the economy: electricity generation, industrial heat, methanol production, residential use, and fertiliser.

This creates a growing gap between supply and demand.

The current policy response has focused on a familiar question: if domestic gas declines, should it be replaced with imported gas?

But this framing is incomplete. Gas is not used for a single purpose. It supports multiple functions, each with different alternatives. There is no single replacement for gas, but there are multiple transition pathways.

At the same time, the scale of the issue is significant. A reduction of 100 petajoules of gas consumption would reduce New Zealand's greenhouse gas emissions by approximately 5 to 6 million tonnes per year – around 7 percent of current national emissions. Decisions about gas are therefore central to New Zealand's climate commitments.

New Zealand is not starting from a position of weakness. It already generates around 85–90 percent of its electricity from renewable sources, supported by hydro lakes that provide long-duration storage. Solar and wind can strengthen this system further, not only by generating electricity, but by preserving stored energy in hydro lakes.

The challenge is how we manage the transition.

A practical pathway involves:

- accelerating renewable generation
- building system flexibility
- reducing non-essential gas demand
- supporting households and industry through transition
- aligning policy with the direction of change

The choice is between actively managing the transition or deferring it and increasing exposure to volatility, cost, and future disruption.

1. The problem

Aotearoa's natural gas supplies, sourced from onshore and offshore fields in Taranaki, are declining and are projected to reduce significantly over the coming decade as existing fields are depleted.

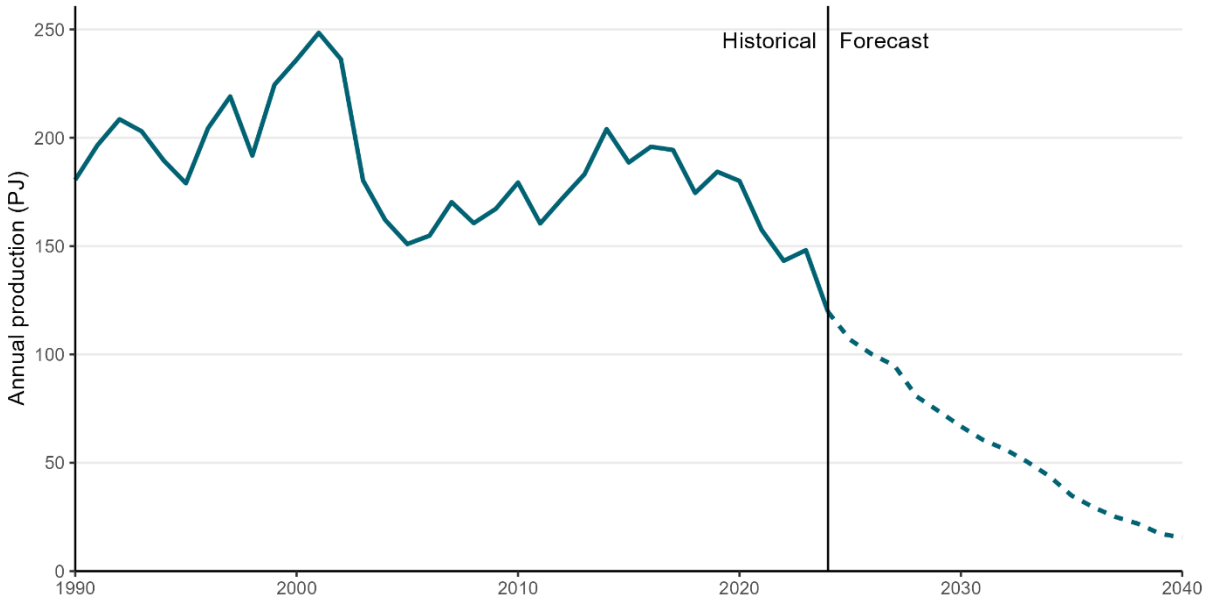


Figure 1: Gas net production (solid line) and forecast production (dashed line) based on production profile data. Image credit MBIE

The **previous Labour Government** stopped issuing new offshore exploration permits and initiated programmes to support large industrial users to transition away from gas.

Reducing gas use has a material impact on Aotearoa's emissions profile. Based on current emissions factors, a reduction of 100 petajoules of gas consumption would reduce greenhouse gas emissions by approximately 5 to 6 million tonnes of CO_2-e per year, around 7 percent of current national emissions. This places decisions about gas use at the centre of Aotearoa's climate commitments.

Over a decade, sustained reductions of this scale would avoid more than 50 million tonnes of emissions. The transition away from gas is an energy decision **and** is a climate decision of national significance.

The **current government** has reversed aspects of this policy direction and allocated $200 million to encourage further exploration. However, even if new gas reserves were discovered, it would likely take many years before they could be developed and brought into production.

In response to declining domestic supply, the government has proposed importing liquefied natural gas (LNG). To transport natural gas, it must be cooled to a liquid state at the point of export and then regasified upon arrival. This process, along with international shipping, adds significant cost.

As a result, imported gas is expected to be more expensive than domestic supply, exposing New Zealand to international price volatility.

There are also emissions implications. The additional processing and transport of LNG increase its lifecycle emissions. Natural gas is primarily methane, a potent greenhouse gas, and leakage across the supply chain further increases its climate impact.

The debate about LNG has often been framed as a simple question: if domestic gas supply declines, what replaces it? This framing assumes that gas is a single problem requiring a single solution.

It is not.

Natural gas supports multiple functions across the economy, each with different roles, constraints, and transition options. Treating it as a single system obscures the range of choices available.

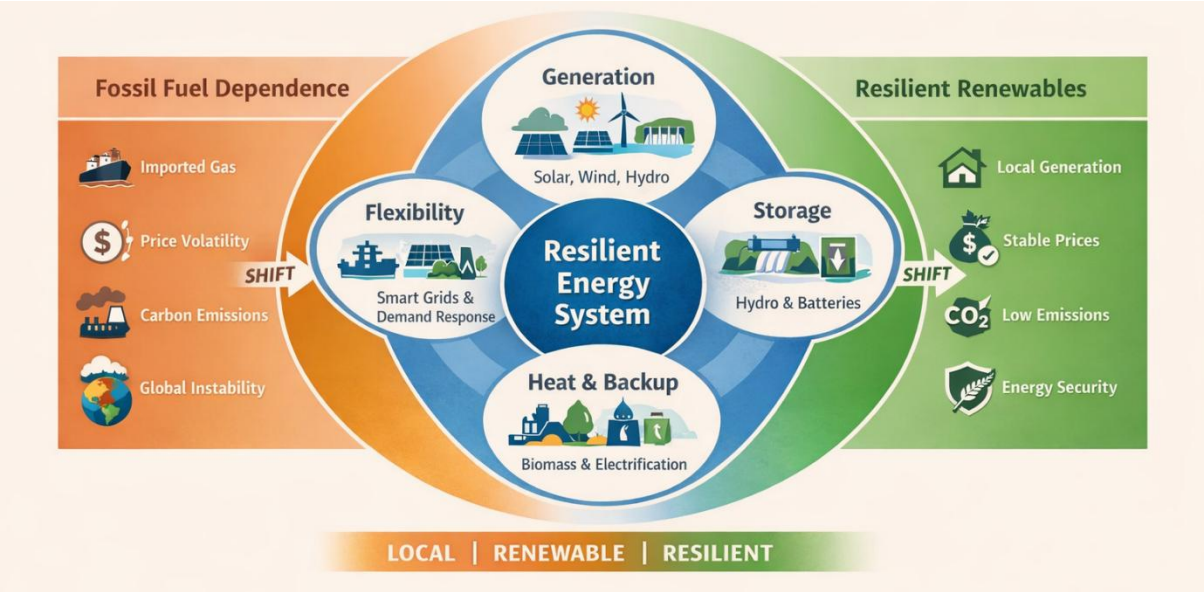


Figure 2: Energy options for Aotearoa

At the same time, concerns about dry-year electricity risk are real. Hydro variability creates periods of stress in the system, and gas has historically provided backup. But this does not mean that domestic gas must be replaced with imported gas.

It means the system must become more flexible.

Importing LNG does not resolve the underlying issue of declining gas supply. It replaces a domestic resource with an imported one, increasing exposure to international markets and reducing national control over energy costs.

2. Aotearoa's advantage – solar, wind, and hydro

New Zealand's electricity system is already unusual by global standards. It is predominantly renewable, supported by hydro lakes that function as long-duration energy storage. This provides a level of resilience that many countries lack.

Solar and wind do more than simply add generation. They reduce demand on hydro lakes during daylight hours. This preserves stored water, effectively increasing available energy for later use, including during dry periods.

This interaction between solar, wind, and hydro is a critical system advantage.

It means that:

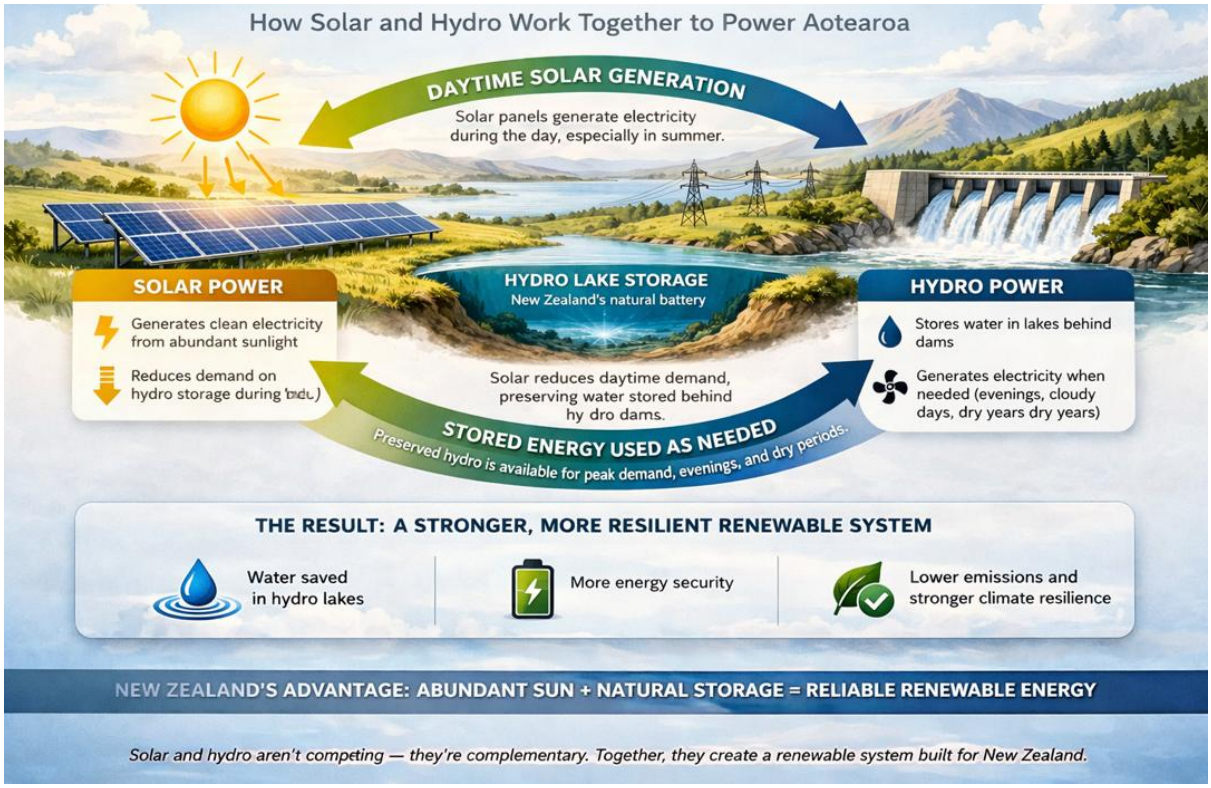
- energy can be generated when available
- and stored for when it is needed

New Zealand does not have a fossil-based electricity system transitioning to renewables. It has a renewable system managing variability.

Marine energy potential

Aotearoa's extensive coastline also presents an opportunity for marine energy, including tidal and wave generation. Unlike solar and wind, some marine energy resources are highly predictable and can provide a more consistent output, making them well-suited to supporting system stability.

While marine energy is not yet cost-competitive with more mature renewable technologies, development is advancing internationally and locally. Over time, it may play a complementary role alongside solar, wind, and hydro, contributing to a more diverse and resilient energy system.



3. Where gas is used and why it matters

Natural gas in Aotearoa is used across five main areas.

Electricity generation uses gas primarily for peaking and dry-year support. Its role is not continuous supply, but flexibility. This can increasingly be provided through renewable generation combined with storage and demand response. In 2023, gas supplied 9% of our electricity[1].

Industrial process heat supports sectors such as food processing, timber, and manufacturing. Many of these applications can transition to electrification or biomass, and this transition is already underway in parts of the economy. Mike Casey of Rewiring Aotearoa states that approximately a third of these industries could make the transition economically viably, and a further third would need some assistance.

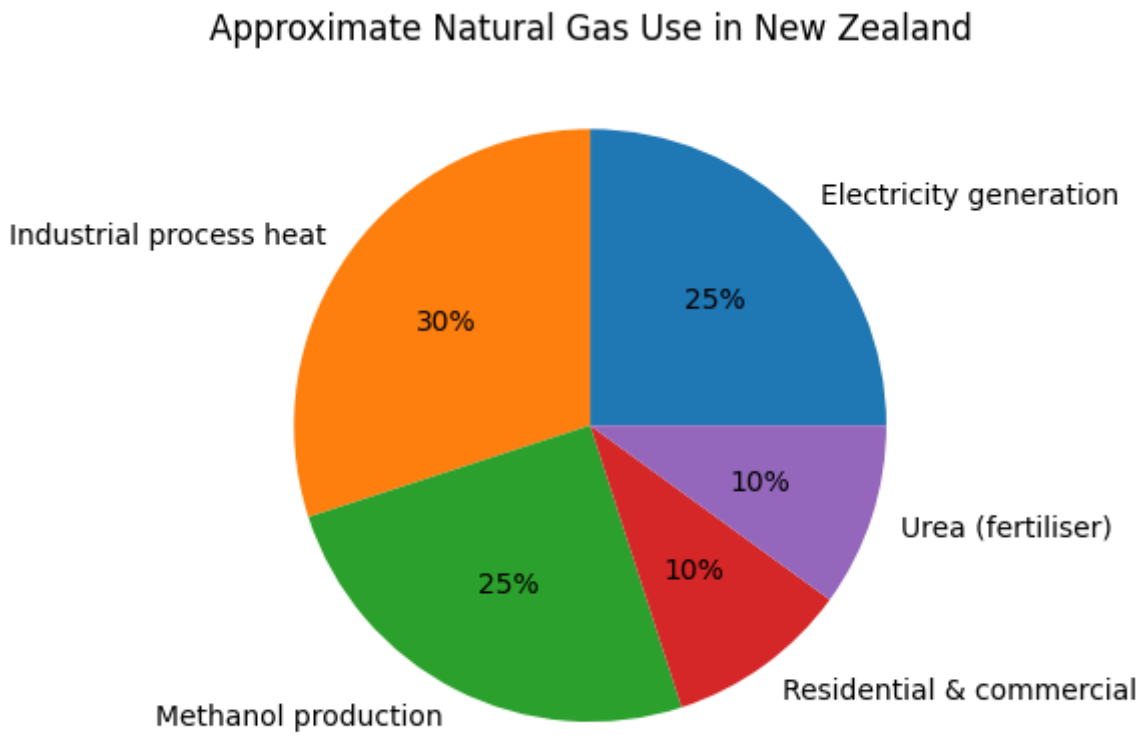
Methanol production is a large-scale industrial use, primarily for export. The Methanex Corporation is a Canadian-owned publicly listed company. It consumes a significant share of New Zealand's gas but does not directly support domestic energy services. This makes it one of the most flexible components of gas demand.

Residential and commercial use includes space heating, water heating, and cooking. These uses can be replaced with electric alternatives, but the transition is constrained by upfront cost and infrastructure.

[1] Ministry for the Environment

Fertiliser production (urea) relies on gas as both feedstock and energy source. However, urea can be imported, and its use can be reduced through improved practices and regenerative farming systems.

The key insight is simple. Gas demand is not fixed. It is distributed and, therefore, can be redesigned.



4. Transition Pathways

There is no single replacement for gas. There are multiple pathways, each addressing a specific use. Electricity generation can transition through a combination of solar, wind, hydro optimisation, geothermal and batteries. These provide both energy and flexibility.

- Industrial heat can shift toward electrification and biomass, supported by efficiency improvements.
- Methanol production can scale down over time, particularly as gas becomes more constrained and valuable for domestic use.
- Residential demand can decline as households transition to electric appliances.
- Fertiliser use can be reduced through changes in farm systems, while supply can be supplemented through imports if required.

These pathways are not theoretical. Many are already underway. The transition away from gas is a coordinated redesign of multiple systems.

Emerging Transition Pathways

Across Aotearoa and internationally, a wide range of practical transition options are already being explored. These do not represent a single solution, but a portfolio of approaches that can be combined over time:

- **Geothermal industry precincts**
  Locating heat-intensive industries alongside geothermal resources to provide low-emissions process heat.
- **Circular industry systems**
  Co-locating industries so that waste heat and by-products from one process become inputs for another (e.g. data centres, food processing, greenhouses).
- **Electrification of equipment**
  Phasing out the sale of new gas-fired appliances and replacing them with electric alternatives over time.
- **Agrivoltaics**
  Integrating solar generation with farming systems, allowing continued land use while generating energy and income.
- **Marine energy**
  Emerging technologies such as tidal and wave generation, including local initiatives such as the Ruka Marine Turbine.

These examples illustrate an important point:

The transition away from gas is not dependent on a single breakthrough. It is already being built through many parallel innovations.

5. Prices, Australia, and equity

Electricity prices reflect how the system is structured.

Australia provides a useful comparison. Over the past decade, large-scale investment in solar and wind has reduced wholesale electricity costs, particularly during periods of high renewable generation.

The graph below shows how wholesale prices in Australia declined after their impressive solar builds began. Note that a fossil fuel crisis associated with the Covid 19 pandemic spiked prices. Australian prices plunged in the last three years. By contrast, New Zealand prices have shown a sharper incline.

However, the benefits have not been evenly distributed. Households with rooftop solar have seen significant savings, while renters and lower-income households have had less access to these benefits.

At the same time, Australia's large geography has required significant investment in transmission infrastructure, increasing system costs.

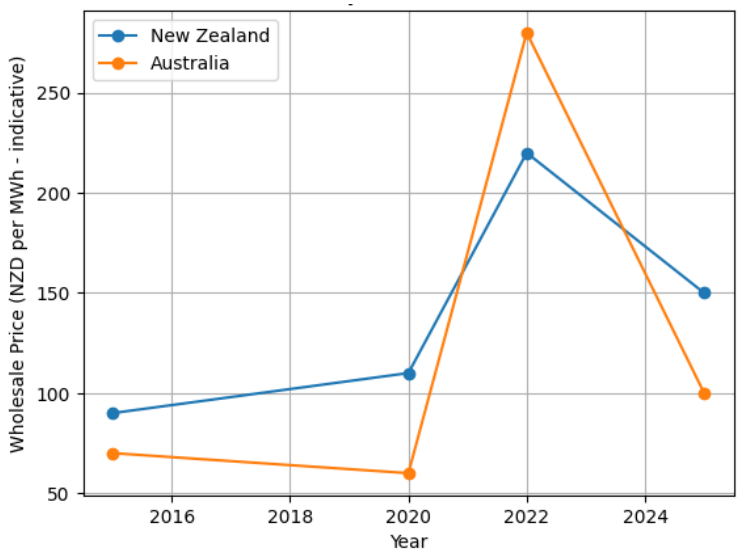


Figure 3: Comparing Australian and New Zealand wholesale energy prices

Aotearoa is in a different position.

It has:

- a higher baseline of renewable generation
- a more compact transmission system
- strong potential for distributed energy

This creates an opportunity. Renewable energy can reduce costs. But only if the system is designed to share those benefits.

6. Policy, Risk, and System Direction

Gas supply constraints are not unique to Aotearoa. Across OECD countries, they have driven significant changes in energy policy.

In Europe, reduced reliance on Russian gas exposed the risks of dependence on imported fossil fuels. Prices rose sharply, prompting accelerated investment in renewable energy and efficiency.

The lesson is clear.

Gas dependency exposes energy systems to:

- global price volatility
- geopolitical risk
- supply uncertainty.

What is driving current policy direction?

If the transition pathways are known, why are they not the primary focus? Energy policy does not develop in a vacuum. It reflects a combination of influences.

1. **Risk management:** There is a legitimate concern about supply shortages and dry-year electricity risks. This tends to favour solutions that appear reliable and immediate.
2. **Economic and political pressures:** Governments face cost-of-living concerns, regional employment considerations, and pressure to avoid disruption. These can favour continuity over transition.
3. **Institutional inertia:** Energy systems evolve slowly. Existing infrastructure, regulatory frameworks, and planning assumptions are often based on past conditions rather than emerging ones.
4. **Industry influence:** Like all sectors, the energy system includes stakeholders with a strong interest in outcomes. Established industries actively lobby to shape how problems and solutions are framed. This is a normal part of policymaking, but it can influence which options receive attention. Who are the voices the government is listening to?

A structural tension in the system

There is another feature of the system worth noting. The government plays multiple roles, as policymaker, regulator, infrastructure owner, and as a shareholder in electricity companies. For example, through its 51% stakes in Meridian, Mercury, and Genesis, the Crown receives hundreds of millions of dollars in dividends each year, depending on company performance and market conditions.

Returns from electricity generation are linked, in part, to market conditions including periods of higher prices.

This does not imply intent. But it does highlight how different incentives exist within the system. Some parts are designed for stability and reliability, while others operate within market dynamics where scarcity can increase returns.

The risk of misalignment

Taken together, these factors create a risk. Policy may be responding to a changing system, using assumptions from the system's earlier context. This can lead to stranded assets – investments in infrastructure that may not be needed in the long term. This delays action and increases exposure to global price volatility

This creates the risk of misalignment, where infrastructure decisions do not reflect the requirements of a sustainable future.

7. A Practical Pathway

Declining gas supply provides a natural timeline for transition. A practical pathway does not rely on a single solution. It combines multiple actions.

- Renewable generation can be accelerated, particularly solar and wind.
- System flexibility can be improved through storage, demand response, and smarter grid management.
- Non-essential gas demand can be reduced, beginning with the most flexible uses such as methanol.
- Industrial and agricultural transitions can be supported through existing and emerging alternatives.
- Households can be supported through an orderly and equitable transition.

The Role of the Ratepayer Assistance Scheme

One of the most promising tools for enabling household transition is the Ratepayer Assistance Scheme. Under this model, financing is provided at low interest over long periods. Repayments are made through local authority rates. The debt is attached to the property rather than the individual. This allows households to spread costs over time, aligning repayments with energy savings.

It also enables participation by low-income households, renters (through landlord participation), and communities that would otherwise face barriers. It shifts the transition from an upfront cost to a long-term investment in infrastructure.

A transition menu

Over the next five years, a coordinated approach could:

- accelerate renewable generation and system flexibility
- reduce non-essential gas demand
- support industrial and agricultural transition
- enable household participation through financing mechanisms
- integrate these steps into a coherent national strategy

Local Innovation in Practice: The Ruka Marine Turbine

A practical pathway is not only about large-scale infrastructure. It is also emerging through local innovation.

The Ruka Marine Turbine, developed by Northland innovator and kaumātua Millan Ruka, is designed to generate electricity from flowing water in a wide range of environments, including rivers, estuaries, tail races, and coastal marine settings. This approach reflects a different model of energy development:

- small-scale and distributed
- adaptable to local conditions
- working with natural flows rather than imposing large infrastructure

While still in development, innovations such as this demonstrate that the transition is already underway — not only through national policy and major projects, but through community-led solutions grounded in place.

A resilient energy future will be built not just from the top down, but from the ground up.

8. The Wider Opportunity

This is not only an energy transition. It is an opportunity to reduce exposure to global volatility, strengthen local resilience, improve environmental outcomes, and design a more equitable system.

The alternative is continued dependence on declining domestic resources and volatile international markets.

Conclusion

Aotearoa already has most of what it needs to build a resilient energy future.

The transition away from gas is not constrained by a lack of alternatives. It is shaped by how decisions are made. The future will change either way. The question is whether that change is guided.

Call to Action

We call on decision-makers to:

- abandon plans for LNG infrastructure
- develop a comprehensive renewable transition strategy
- support households and industry through equitable transition mechanisms such as the Ratepayer Assistance Scheme

- align energy policy with climate commitments

Please also sign the Greenpeace petition here.

Acknowledgement

This document has been developed with the assistance of artificial intelligence, alongside human judgment, experience, and collaboration.

It has been prepared with urgency by volunteers to support a public conversation about Aotearoa's energy future.

It reflects an approach to knowledge as something that can be shared, refined, and applied in service of the common good.

AI has been used as a tool to help organise and express ideas. Responsibility for the content and conclusions rests with the author.

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Climate Action
TAI TOKERAU