Priority One
Tauranga
Moana

Our Energy Future

Energy in Western Bay of Plenty Subregion

An analysis of our regional energy context across stationary energy, transport and industrial process heat.

Executive Summary

Executive Summary

Energy in the Western Bay subregion

An analysis of our regional energy context across stationary energy, transport and industrial process heat.

Author: Timothy Allan Contributors: Mike Pond.

Complex energy needs

Tauranga and the Western Bay have a complex range of energy needs that are being driven by: significant GDP growth (averaging 4.6% CAGR); additional step loads to industrial energy demand; and the drive to decarbonise to maintain social license and competitiveness in offshore markets.

Disconnection and a lack of engagement

Priority One has been involved with a range of central government led initiatives; Regional Energy Transition Accelerator (RETA), MBIE Energy Strategy, and the Transpower Major Capex Proposal. This has illustrated a disconnection between stationary energy and transport energy and demonstrated a lack of engagement and coordination within the wider industry and local government.

The result could be ongoing and significant constraints to both growth and the economy and an inability to effectively transition to low carbon fuels. To establish this energy strategy, we have taken a deliberately broad look, encompassing stationary energy, industrial process heat, and transport.

National context

New Zealand's renewables have reached 88% of 'electricity' generation in 2023. When we step back and look at total 'energy' consumption (including refined oil products such as petrol, diesel, and aviation fuel) renewables have dropped to 30.1% of our total. Energy self-sufficiency and energy intensity have declined or remained static.

Regional challenges

Regionally, we have limited electricity generation and are a net importer via the grid. Most of the Bay of Plenty generation is at the eastern end of the region (around Kawerau) but the bulk of the load is near the western end (near Rotorua and Tauranga), so power flow within the region is generally from east to west (Transpower 2023). There is one dominant 220kV double circuit into the region, which presents resilience issues should anything impact that line.

There is a limited amount of non-transmission solutions (solar, geothermal, batteries etc) at scale deployed either residentially or commercially.

Freight and logistics

The region has the largest port in New Zealand, the Port of Tauranga which transacts 50% of the value of goods exported by the region. The Bay of Plenty Regional Council completed a Community Carbon Footprint in 2021, this highlighted that the largest contributor to the region's emissions was transport at 44% (when marine freight is considered). The region's emissions have increased 12% in between the reporting periods of 2015/16 and 20/21. Transport emissions are hard to shift with technologies

like hydrogen and biofuels for heavy vehicles and green methanol for shipping offering potential pathways to decarbonisation.

Industrial process heat

The Regional Energy Transition Accelerator (RETA) highlighted that 88% of the region's industrial process heat emissions are from natural gas. This is largely due to the fact the region has reticulated gas supply. This contributes 4.8% of the gross emissions to the region.

It anticipated due to international commitments and national policy and environmental statements, alongside changing consumer preferences, that gas demand will decline alongside declining supply from existing gas fields. This presents a challenge for regional process heat users. Biogas and biomethane have been investigated as a potential pathway for replacing natural gas, as it has the ability to utilise the same infrastructure.

Future of electricity

Starting in 2023, Transpower and Powerco entered a major capital expenditure process in the Western Bay. As a part of this, they formulated a set of consultation documents that looked at the electricity demand growth and resulting challenges through to 2050.

"*As demand continues to grow in the Western Bay of Plenty, transmission constraints will emerge.... To supply the fast-growing forecast load requires development within the distribution network as well as the transmission system*"

Transpower and Powerco have taken both a top-down and bottom-up review of demand through to 2050, looking at the base growth, step loads (new demand from manufacturing and other new developments etc.), uptake of EVs, decarbonisation of industrial processes and transport, along with the uptake of solar and battery storage. Our peak (winter) demand is projected to increase from just under 300MW to just over 500MW, while total energy demand annually rises from 1.3TWh to over 2.4TWh in 2050. Step loads are expected to play a major role in driving growth in the region in the next 10 years, contributing 84MW to 108MW to peak growth by 2030.

Pathway to Net Zero.

New Zealand signed-on to the legally binding Paris Agreement, which commits the country to achieve net-zero emissions by 2050. In addition, the country has established an interim target of a 10% reduction in emissions from 2017 levels by 2030. Internationally, there are incoming directives that will impact our exporters such as the Carbon Border Adjustment Mechanism (CBAM), which is aimed at preventing carbon leakage across borders with countries that have less stringent climate policy. This creates an imperative for businesses to decarbonise over the next 25 years.

Technical, economic and political uncertainty

Business have expressed there is considerable technical, economic and political uncertainty. This is impacted by changing policy and regulatory settings (both here and abroad), evolving customer preferences, a rapidly evolving macro-economic environment, and the difficulty of selecting the right technology before mainstream adoption. The future, security and cost of energy were front of mind for businesses across the spectrum.

Regional opportunities

Within our region there are specific technologies which could be further developed for commercial application including Geoheat, biomass, and biomethane. These can reduce the region's GHG

emissions and improve our energy resilience. These nascent technologies need to be developed further before commercial application by regional businesses.

Interdependence

There is a high level of interdependence between stationary energy, process heat and transport energy. The solutions for decarbonisation are also highly connected and could be advantaged when considered together rather than separately. Some use the same base material (i.e. biomass) or could be made more cost effective through utilisation of new platform technologies (i.e. Geoheat).

Energy reporting

The Western Bay subregion currently does not have energy reporting across stationary, process heat and transport. This will present a challenge into the future when tracking our progress around the transition to low-carbon energy sources.

Decarbonisation is a significant regional threat

A significant part of our regional emissions is related to freight and logistics. Setting aside the debate of where these emissions should be attributed, they are hard to shift and have international commitments attached to their reduction. While there are a range of technologies available today, many require systemic change and are difficult for any one company to take ownership of. They require regional and national commitment to change.

Collaboration and coordination

Businesses have indicated a weakness in the current approach is a lack of collaboration and coordination. Most businesses are tackling the same or similar challenges in isolation and without the benefit of collective support.

Highly Regulated

The electricity sector and system in New Zealand are highly regulated. Who and how they are regulated is a key piece of information for politicians, local body analysts, businesses, consumers and investors.

Constantly evolving

Patterns of electricity demand and supply are constantly evolving - It's important to emphasise that there is not a static picture, but patterns of demand and supply are evolving rapidly. The reference to systems, loads, demands, supply and stats is not static.

Technology and Flex Markets

The role of technology and emerging flexible (flex) markets in the electricity sector are likely to play a key role in the future. Distributors are looking to utilise energy effectively across the spectrum more flexibly to meet the dynamic needs of both consumers and businesses.

Our Energy Future

The facilitated energy forums, attended by businesses within the region, developed a vision statement that articulated our energy future:

"Our region will be energy self-sufficient and a net exporter of clean energy, creating economic advantages and opportunities for growth. We will lead the way in low-carbon transport and industrial innovation, integrating energy systems with advanced infrastructure while ensuring energy equality and accessibility for every community."

The group set out some key themes:

1) Strategic and collaborative planning
    a) Clear business, regional, and community-focused plans are essential for guiding the energy transition, supported by flexible regulatory frameworks and strong collaboration across sectors.
2) Innovation and technology
    a) Developing and deploying innovative technologies (hydrogen, solar, wind, geothermal) and energy storage systems, alongside incentivising trials and clean energy projects, will be crucial.
3) Policy and financial support
    a) Financial incentives and enabling policies are necessary to accelerate the adoption of renewables, streamline processes, and support industries in transitioning to low-emissions solutions.
4) Learning from others
    a) A key theme is to adopt proven systems and solutions from other regions, learning quickly and implementing what works best for local contexts.
5) Community and stakeholder engagement
    a) Education, awareness, and engagement with local communities and businesses are seen as vital to driving collective action and fostering a smooth energy transition.

Energy Strategy

The goal of this work was to lead into the development of an Energy Strategy on completion of this review. That would done in conjunction with and be led by business. To support this Priority One has developed a programme of work over the next 12-18 months. It is anticipated that this strategy would be completed in 2025.

The key areas we would be seeking to address:

- There is not a coordinated regional energy strategy or reporting, meaning we do not know our current and future position.
- We are reliant on a singular significant line of energy supply into the region, which is a risk to our resilience.
- Our manufacturers are reliant on gas for process heat and will need to transition away from this in the near term.
- We are a freight and logistics hub and face significant pressure to decarbonise within the next 25-year period.
- It is currently more challenging to obtain consents required to implement new technology in our region compared to elsewhere.
- The high level of uncertainty facing businesses on transition requires a more collaborative approach and support from across the spectrum to succeed.

Outcomes

For the energy strategy to effect change it needs to be action oriented. Some of the key outcomes it needs to achieve:

a) Increase awareness and acceptance of the core issues at the regional leadership level, both politically and commercially.
b) Drive support from business to be able to translate strategy into action with the required level of financial support.
c) Create momentum, government acceptance, and ideally funding for this region to lead the decarbonisation of freight and logistics nationally.
d) Network with other regions (like Taranaki) with a view to collaborate on key technology and to combine the regional support for new technology platforms and projects.

Specific actions that would lead to outcomes:

1) Our Energy Future (Priority One)
   a) Put together a dedicated energy event to launch the energy strategy and the vision developed by our businesses and provide a catalyst for discussion and activity including:
      i) Case studies of innovation approaches being used in our region and New Zealand to solve energy problems across stationary energy, process heat and transport.
2) Support Business Transition & Resilience (Priority One)
   a) Information & Education (Priority One)
      i) Assist businesses by providing information and education opportunities around new technologies.
   b) Directly support the active transition to decarbonise energy systems and energy use regionally.
   c) Directly support the development of both new generation and non-transmission solutions within the region.
3) Form an Energy Leadership Group (Business led, Priority One facilitated)
   a) Drawn from industry and local government to coordinate our energy strategy, reporting, delivery and advocacy. Seek support and funding from the region to coordinate this activity and enable the group to perform specific research on behalf of industry.
      i) Assist with coordinating support for research into regional energy opportunities, to bridge the gap between research and commercial adoption, such as:
         (1) Geothermal
         (2) Biomass
         (3) Biogas
         (4) Hydrogen
   b) Start functional reporting on energy use for the region to understand our current position and to assist with planning.
   c) Develop a Regional Energy Plan using Dynamic Adaptive Planning Pathways (DAPP) for our region.