



Past and future generation pipeline

11 October 2024


concept
consulting

About this work

Concept prepared this report for the Electricity Retailers' Association of New Zealand (ERANZ). The scope of our work was to outline key data about electricity generation build over recent decades, as well as the outlook for new projects in the pipeline. We have also described important events that would have had an impact on generation development.

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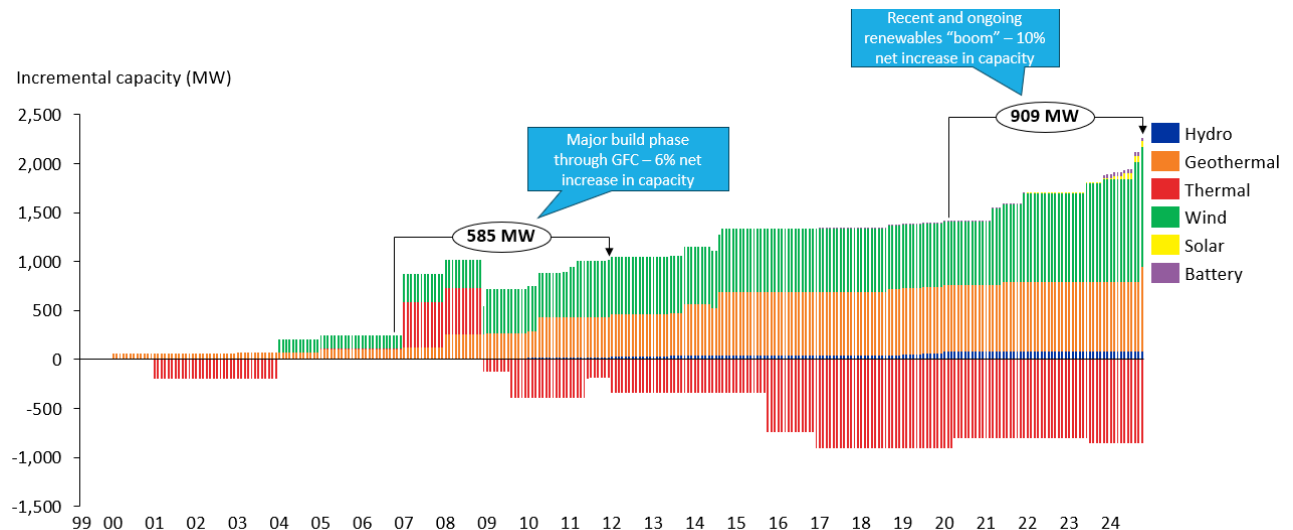
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1 Executive summary/introduction

Over the past ~25 years there has been ~1,400 MW of net new capacity built, despite major fossil fuel retirements. Starting from a baseline of ~9,000 MW, this represents a ~16% net increase in capacity.

Capacity growth has been particularly strong over the last few years, as well as during the global financial crisis in the late 2000s.

Figure 1: Installed capacity changes since 1999



Total renewable capacity has increased by ~2,250 MW, broken down as follows:

- ~1,200 MW increase in wind capacity
- ~850 MW increase in geothermal capacity
- ~100 MW increase in hydro capacity
- ~100 MW increase in solar and battery capacity (mostly in the last few years)

There has also been an 850 MW net decrease in thermal capacity during this time, or ~26%.

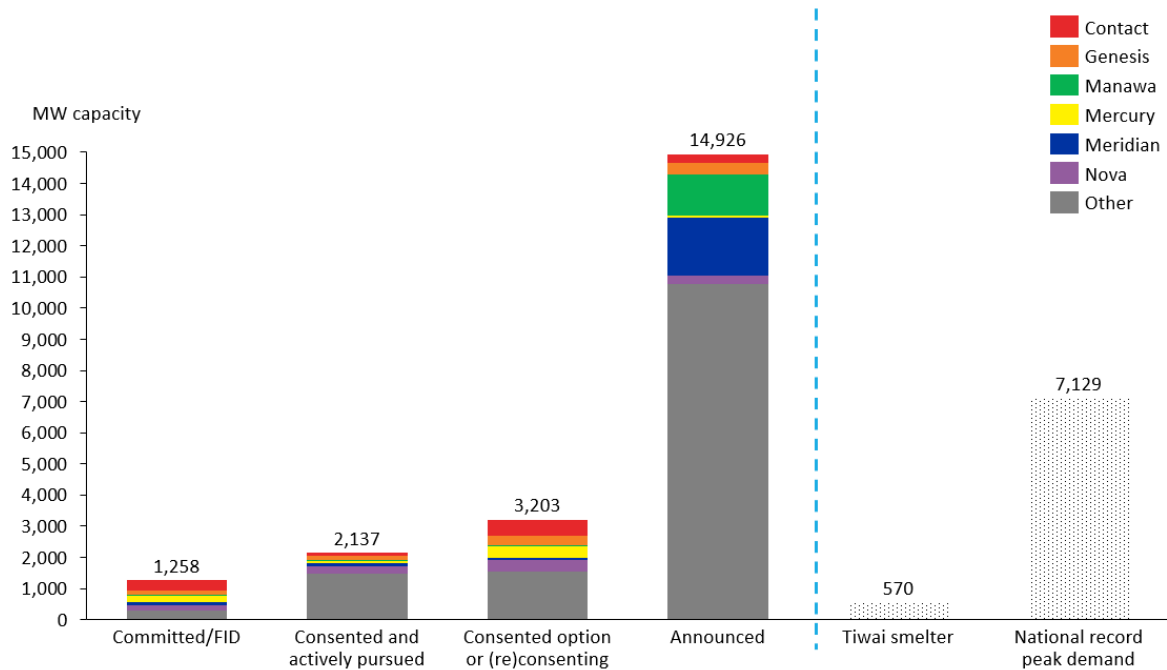
These trends have been influenced by a range of factors, including:

- Demand growth – over the past few decades, economic and population growth effects have been muted by increased energy efficiency and the exit of some industrial plant.
- Tiwai uncertainty – since 2019 there has been substantial uncertainty about the future of New Zealand's largest electricity consumer (the Tiwai Point aluminium smelter), until it recently signed new electricity supply contracts out to 2044. This created a real possibility that there would be a steep and substantial decrease in demand.
- Carbon prices – New Zealand developed its Emissions Trading Scheme (ETS) in 2008, making thermal generation more expensive. However, transitional policies kept carbon prices generally subdued until 2021.
- Regulatory uncertainty – various policies, but particularly the New Zealand battery project, appear to have deterred investment in recent years, by creating ongoing uncertainties.
- Gas supply – gas supply and reserves have fluctuated over time. When gas is scarce, gas prices (and therefore electricity prices) tend to be higher, incentivising the build of other forms of generation.
- Transmission – new transmission capacity can take a long time to consent and develop. There was also substantial uncertainty around how transmission costs would be recovered from customers, until the transmission pricing methodology reform was finally settled in 2022.

- Other factors – changes in macroeconomic factors such as recessions, interest rates and Covid-19 also influence the supply and demand balance of electricity.

We expect this capacity to continue to grow. There are currently ~1,250 MW of new projects that have reached final investment decision (FID) and are considered committed.

Figure 2: Future generation pipeline (capacity)

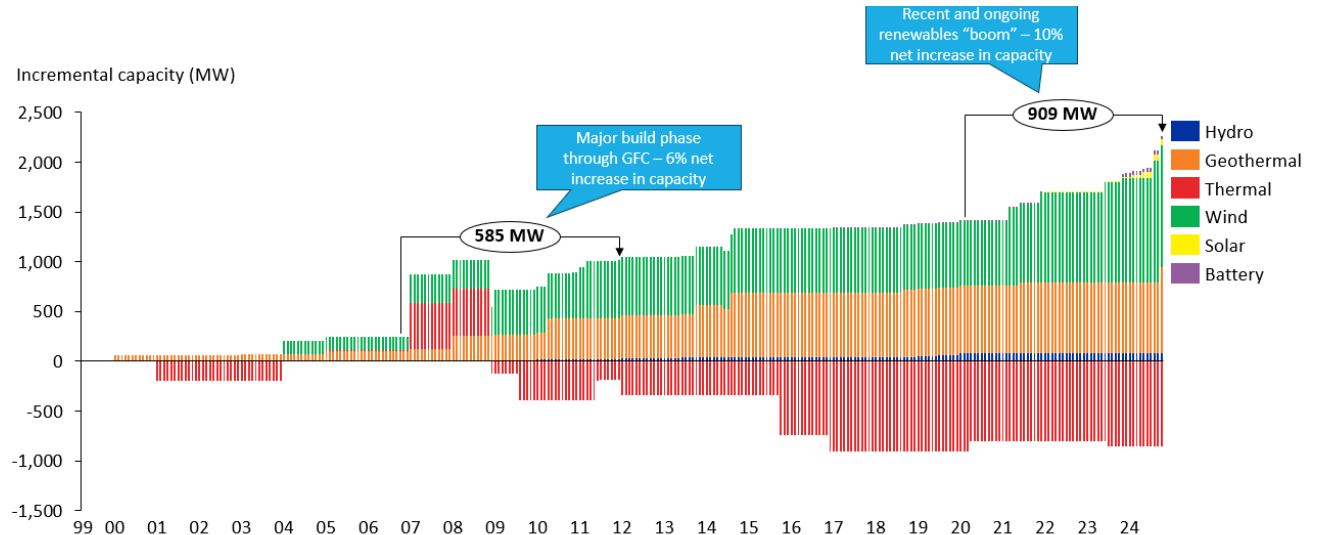


Many other projects are also in the pipeline at varying stages of progress.

2 Past build

Approximately 1,400 MW of **net** new capacity has been added between 1999 and today. Starting from a baseline of ~9,000 MW, this represents a ~16% **net** increase, which includes major fossil fuel thermal plant retirements.

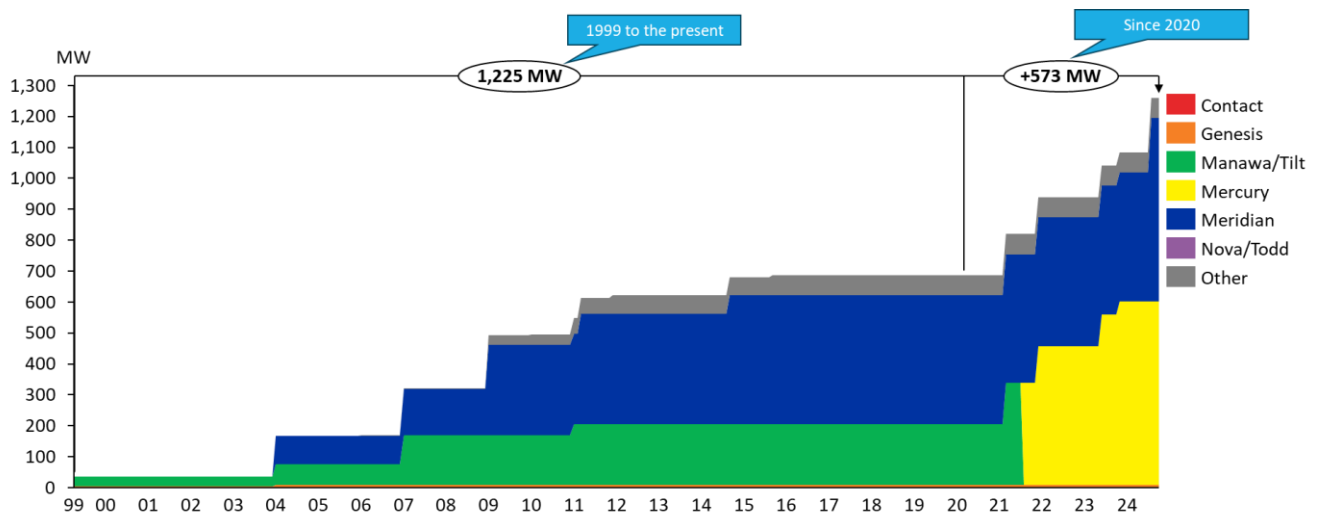
Figure 3: Installed capacity changes since 1999



2.1 Wind

Over 1,200 MW of wind capacity has been added since 1999 from a negligible base. Most of this build has come from Meridian, Mercury, and Manawa/Tilt (previously Trustpower, later acquired by Mercury), largely due to strategic decisions by these parties to specialise in wind development.

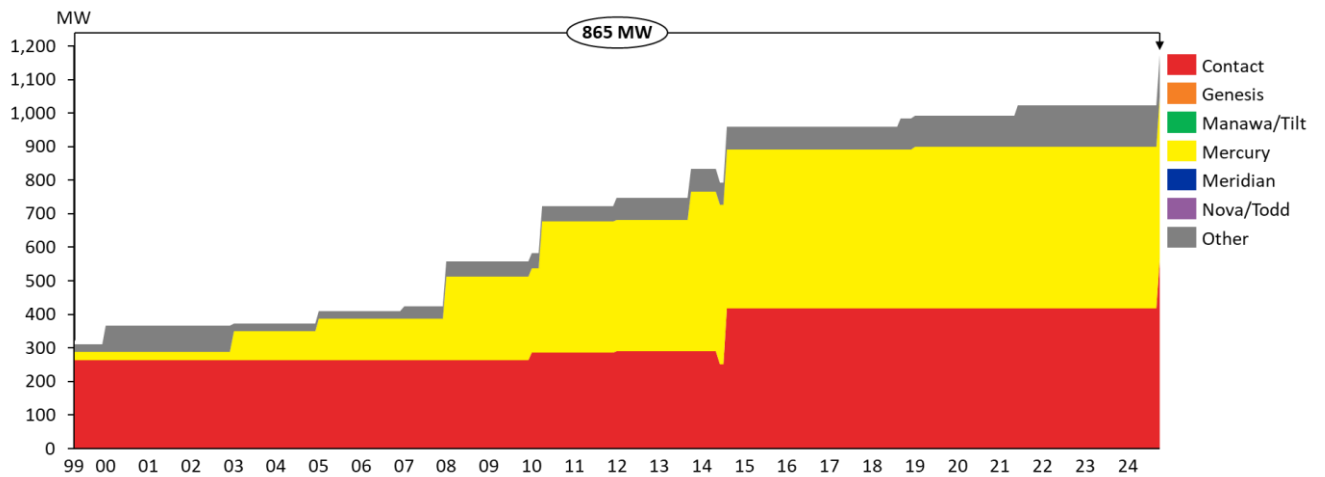
Figure 4: Installed wind capacity since 1999 (by generator)



2.2 Geothermal

Over 850 MW of geothermal has been added since 1999. Mercury, and to a lesser extent Contact (who had substantial geothermal capacity prior to 1999), have led this build following strategic decisions to expand their geothermal fleets and development capabilities.

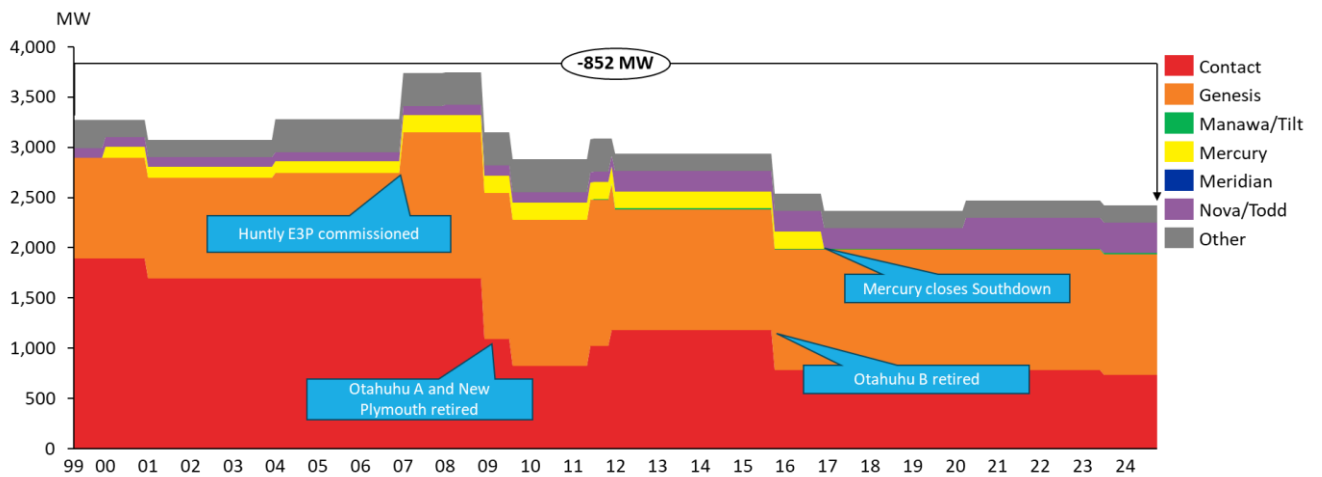
Figure 5: Installed geothermal capacity since 1999 (by generator)



2.3 Thermal

Net thermal capacity has contracted by ~850 MW since 1999 (~26%). There has also been some new thermal plant commissioned during this time, but this has been mostly peaking generation, whereas major retirements have been mostly baseload generation.

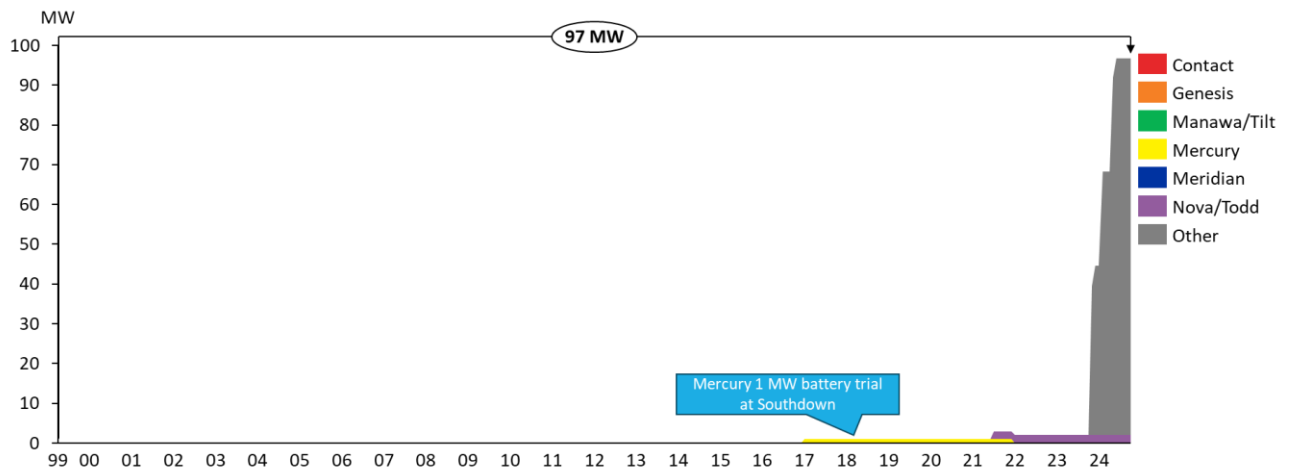
Figure 6: Installed thermal capacity since 1999 (by generator)



2.4 Solar and battery

There has been very little utility scale solar and battery projects commissioned until the last year, which has seen rapid growth. This is expected to continue into the future (see next section).

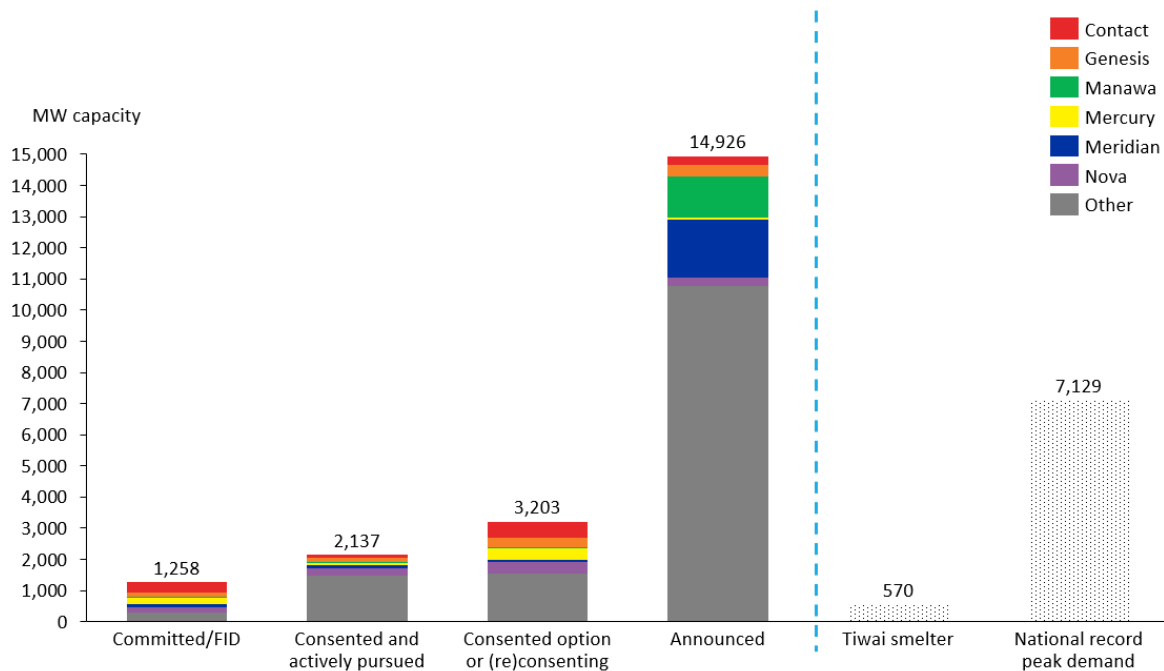
Figure 7: Installed solar and battery capacity since 1999 (by generator)



3 Future build

There are ~1,250 MW of utility scale generation and battery projects that have been committed (i.e. reached final investment decision or FID). Many of these are already under construction, and all are expected to be completed by 2027. The committed projects include 300 MW of grid scale batteries by Meridian (100 MW, Ruakākā), Contact (100 MW, Glenbrook) and Genesis (100 MW, Huntly.)

Figure 8: Future generation and battery pipeline (capacity)

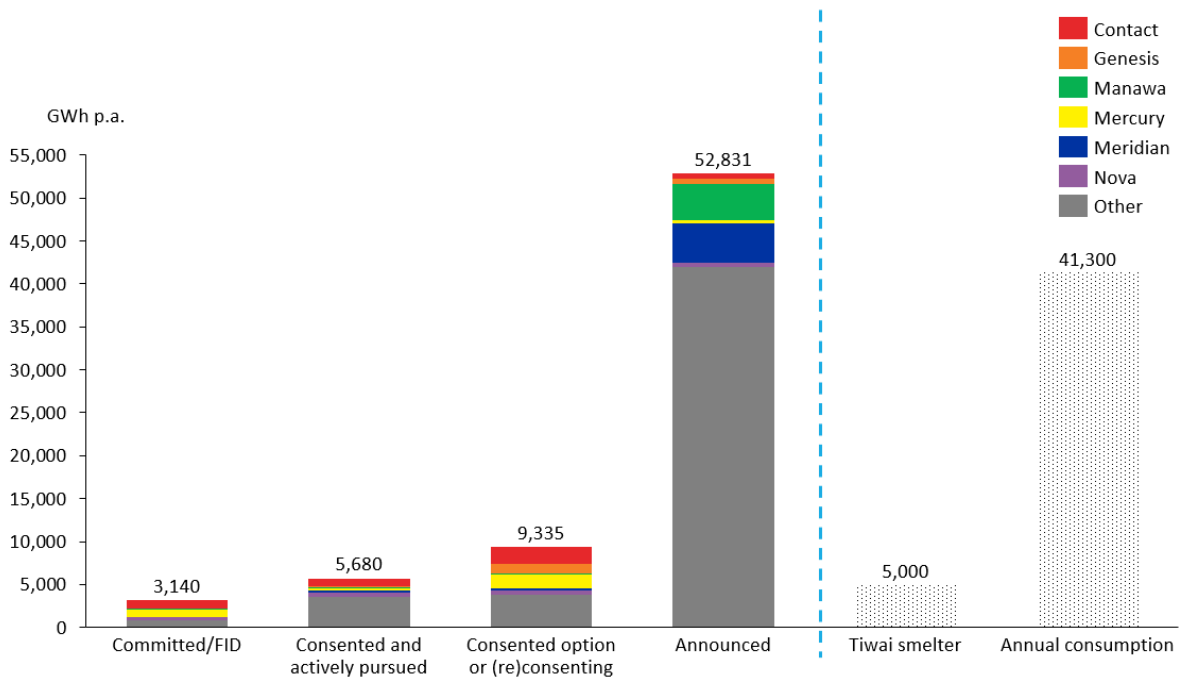


There are also:

- ~2,100 MW of new consented generation and battery projects that we understand are being actively pursued (i.e. they have been consented relatively recently and public reports indicate that the projects are progressing). We expect a reasonable proportion of these projects will be developed.
- ~3,200 MW of projects that have applied for consent, are consented but on hold, or are consented but require a variation. These are less likely to be developed in the next few years but remain options for the future.
- ~14,900 MW of projects that have been announced but do not appear to have applied for consent as this stage, so may still be relatively speculative. More than half of the capacity in this category is made up of offshore wind, which is not likely to be developed until the 2030s (at the earliest).

This new capacity represents a significant increase in energy terms also. This differs slightly from the chart above as different types of projects have different capacity factors (i.e. 1 MW of geothermal capacity will likely generate more energy over a year than 1 MW of solar capacity). Committed and actively pursued projects are expected to produce about ~8,500 GWh annually.

Figure 9: Future generation pipeline (energy)



4 Events affecting demand

Confidence in sustained electricity demand and/or demand growth is understandably a major factor underpinning new generation investment decisions. Major electricity users' decisions to maintain, expand, or contract operations are particularly closely scrutinised.

4.1 General trends

Electricity demand has only grown at an average of 0.32% p.a. since 2006. This is largely due to demand increases from economic and population growth being offset by industrial exit and growing energy efficiency.

Figure 10: Historical electricity consumption

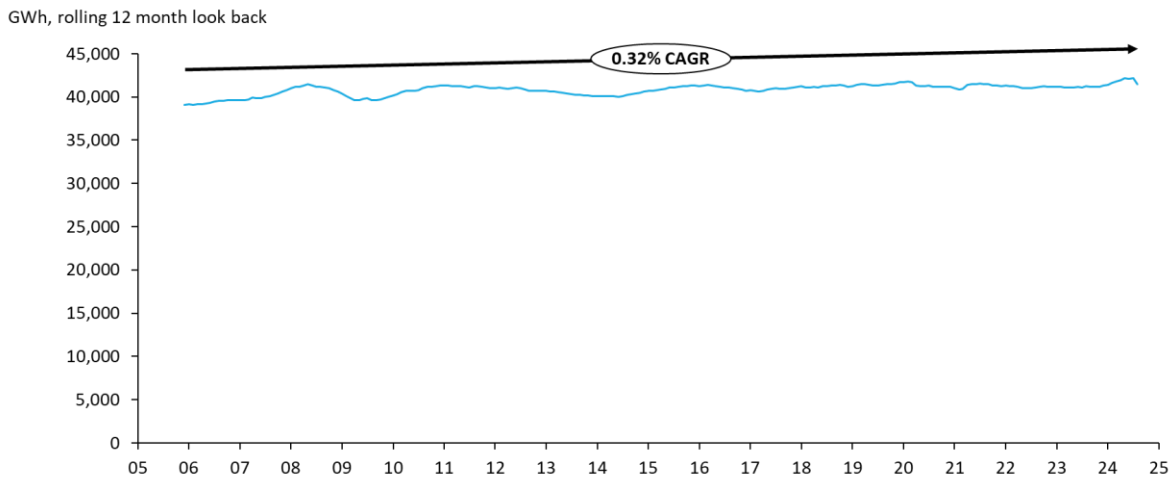
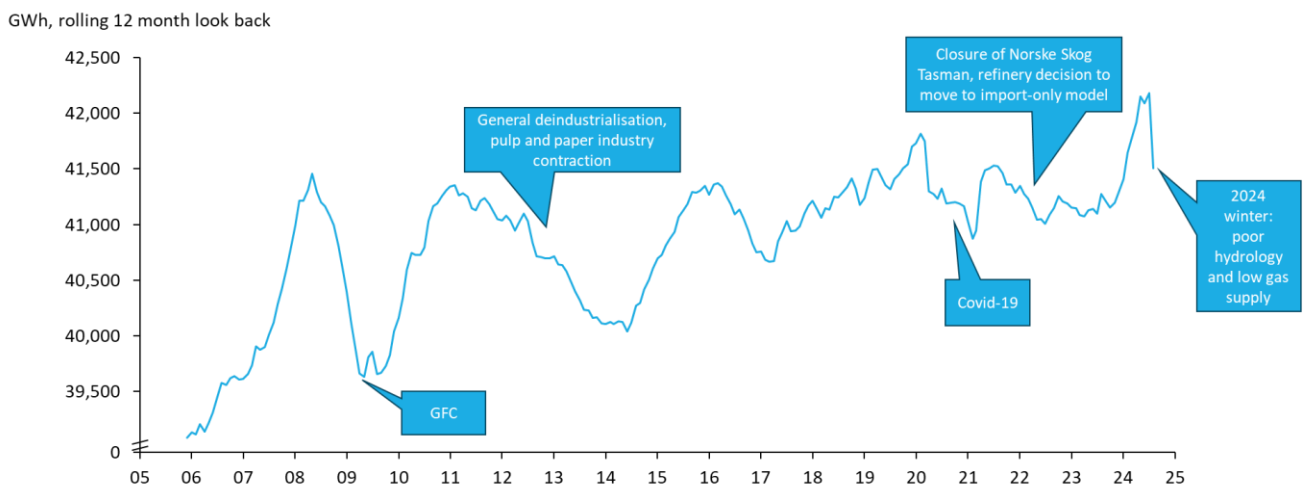


Figure 11: Historical electricity consumption (zoomed in)



4.2 New Zealand's Aluminium Smelter

New Zealand's Aluminium Smelter (NZAS) is the country's largest electricity user by far at ~570 MW baseload consumption and circa ~5,000 GWh annual energy use.

Date	Event	Comments (where applicable)
July 2012	NZAS approaches Meridian to discuss potential changes to existing electricity contract. ¹	Various plans to potentially close the smelter and extensive negotiations have led to prolonged periods of uncertainty about the level of electricity demand in New Zealand, which have caused uncertainty around future prices and the need for new generation.
August 2013	NZAS signs new electricity contract (until at least 2017, but up to 2030) that includes a one-off \$30m govt. subsidy. ²	
October 2019	NZAS announces plan to conduct strategic review. ³	
July 2020	NZAS announces closure for August 2021. ⁴	
January 2021	NZAS defers closure until December 2024. ⁵	
May 2024	NZAS announces new contracts for the next 20 years, which include a demand response component. ⁶	

4.3 Other large industrial load

Date	Event	Comments (where applicable)
Pulp and paper manufacturing		
January 2013	Norske Skog Tasman closes one of two paper machines at Tasman mill. ⁷	A general trend of declining pulp and paper industrial activity going back over a decade.
October 2020	Norske Skog commences review of operations. ⁸	
June 2021	Norske Skog closes rest of Tasman mill. ⁹	
September 2024	Winstone Pulp International announces closure of its two mills in the Ruapehu District ¹⁰ and Oji Fibre Solutions confirms closure of its Penrose mill. ¹¹	
NZ Steel		
July 2020	BlueScope announces review of its NZ Steel business. ¹²	Uncertainty through the Covid-19 pandemic as to the continued operations of NZ Steel, which has since been resolved.
February 2022	BlueScope affirms its commitment to NZ Steel. ¹³	

¹ [Meridian reaches commercial agreement with New Zealand Aluminium \(nzherald.co.nz\)](https://www.nzherald.co.nz)

² [Government welcomes Meridian agreement \(beehive.govt.nz\)](https://www.beehive.govt.nz)

³ [Rio Tinto to review future of New Zealand's Aluminium Smelter \(riotinto.com\)](https://www.riotinto.com)

⁴ [NZAS terminates electricity contract and plans to wind-down operations following strategic review \(riotinto.com\)](https://www.riotinto.com)

⁵ [NZAS reaches deal with Meridian to extend operations to 2024 \(riotinto.com\)](https://www.riotinto.com)

⁶ [Long-term future for New Zealand's Tiwai Point aluminium smelter secured with new power deals \(riotinto.com\)](https://www.riotinto.com)

⁷ [Norske commissioning \\$42m geothermal plant; paper production halved \(energynews.co.nz\)](https://www.energynews.co.nz)

⁸ [2020: the year of strategic reviews \(energynews.co.nz\)](https://www.energynews.co.nz)

⁹ [Norske Skog to close paper mill; eyes pellet expansion \(energynews.co.nz\)](https://www.energynews.co.nz)

¹⁰ [Hundreds of jobs lost as Winstone shuts mills \(rnz.co.nz\)](https://www.rnz.co.nz)

¹¹ [OjiFS confirms Penrose mill closure \(ojifs.com\)](https://www.ojifs.com)

¹² [2020: the year of strategic reviews \(energynews.co.nz\)](https://www.energynews.co.nz)

¹³ [BlueScope commits to future of NZ Steel \(energynews.co.nz\)](https://www.energynews.co.nz)

Date	Event	Comments (where applicable)
May 2023	NZ Steel announces a new electric arc furnace to replace the existing steelmaking furnace and two of the four coal-fired kilns at Glenbrook by 2027, partially funded by a \$140m grant from the Government Investment in Decarbonising Industry (GIDI) fund. ¹⁴	
Marsden Point refinery		
April 2020	Refining NZ initiates strategic review of its business. ¹⁵	A shift in operations from oil refining to an import-only business, resulting in reduced electricity demand.
November 2021	Refining NZ confirms switch to an imports-only model. ¹⁶	
April 2023	Refining NZ (now Channel Infrastructure) reaches final stages of permanent decommissioning of refining assets. ¹⁷	

¹⁴ [Crown, Contact partner in \\$300m NZ Steel upgrade \(energynews.co.nz\)](https://www.energynews.co.nz/crown-contact-partner-in-300m-nz-steel-upgrade/)

¹⁵ [Refining NZ Board confirms transition to import terminal, due to take place in April 2022 \(channelnz.com\)](https://www.channelnz.com/refining-nz-board-confirms-transition-to-import-terminal-due-to-take-place-in-april-2022/)

¹⁶ [Refining NZ Board confirms transition to import terminal, due to take place in April 2022 \(channelnz.com\)](https://www.channelnz.com/refining-nz-board-confirms-transition-to-import-terminal-due-to-take-place-in-april-2022/)

¹⁷ [Refinery decommissioning nears completion \(energynews.co.nz\)](https://www.energynews.co.nz/refinery-decommissioning-nears-completion/)

5 Carbon market developments

Prices in the carbon market provide incentives for new generation investment in two main ways:

1. Higher carbon prices increase the short-run marginal cost of fossil fuel power generation. Increased fossil fuel plant offer prices flow through to higher wholesale market prices, incentivising lower cost new build that is often renewable.
2. Higher carbon prices encourage actors in carbon emitting sectors (e.g., users of fossil fuel boilers for industrial heat and the transport sector) to consider switching to lower cost and renewable alternatives. This tends to drive electrification, and the prospect of increased electricity demand encourages more generation investment.

Date	Event	Comments (where applicable)
September 2008	The Emissions Trading Scheme is enacted through the Climate Change Response (Emissions Trading) Amendment Act 2008, after more than a decade of considering emissions pricing. ¹⁸	First ETS in the world intended to cover all economic sectors and major GHGs over time.
2008 to mid-2015	The NZ ETS allowed trading of units to and from the international Kyoto market. Relatively few restrictions on foreign units valid for surrender in New Zealand existed until: <ul style="list-style-type: none"> • December 2011's ban on surrendering industrial-gas CER units • December 2012's ban on surrendering industrial-gas ERU units and large-scale-hydro ERUs/CERs. 	Importation of cheap foreign CERs and ERUs suppressed domestic carbon prices from circa 2008 to 2013.
December 2009	Climate Change Response (Moderated Emissions Trading) Amendment Act 2009 comes into effect, introducing a fixed price option (a form of price ceiling) set at \$25 per tonne. ¹⁹	In effect a carbon market price cap of \$25/tonne was set.
July 2010	"Transition phase" begins, where: <ul style="list-style-type: none"> • stationary energy, industrial process and transport sectors assumed unit obligations • "one-for-two" transitional surrender regime allowed non-forestry participants to surrender half as many units as would otherwise be required for the emissions.²⁰ 	One-for-two surrender obligations meant reduced demand for emissions units and lower carbon prices.

¹⁸ [A Guide to the New Zealand Emissions Trading Scheme: 2022 Update \(motu.nz\)](#)

¹⁹ [Climate Change Response \(Moderated Emissions Trading\) Amendment Act 2009 \(legislation.govt.nz\)](#)

²⁰ [Climate Change Response \(Moderated Emissions Trading\) Amendments Bill: Approval for Introduction \(environment.govt.nz\)](#)

Date	Event	Comments (where applicable)
January 2013	Climate Change Response (Emissions Trading and Other Matters) Amendment Act 2012 comes into effect, which: <ul style="list-style-type: none"> • maintained transitional measures (“one-for two” regime and \$25/unit fixed price)²¹ • removed date for agricultural emissions to come under the Act.²² 	Reduced the prospect of agriculture’s inclusion in the ETS and thus the demand outlook for emissions units.
May 2016	Climate Change Response (Removal of Transitional Measure) Amendment Act 2016 comes into effect, removing one-for-two surrender regime. ²³	One-for-two surrender obligation removal increases demand for emissions units.
November 2019	Climate Change Response (Zero Carbon) Amendment Act 2019 comes into effect, which: <ul style="list-style-type: none"> • set new targets to reduce net emissions (by 2050) of: <ul style="list-style-type: none"> ○ all greenhouse gases (except biogenic methane) to zero ○ biogenic methane to 24-47% below 2017 levels • required the government to develop and implement policies for climate change adaptation and mitigation • established a system of emissions budgets to act as stepping stones towards the long-term target • established the independent Climate Change Commission.²⁴ 	Established significant impetus for emissions reductions in New Zealand, supported by the ETS, which had arguably been lacking over the past decade or so.
June 2020	Climate Change Response (Emissions Trading Reform) Amendment Act 2020 comes into effect, providing for the fixed price option to increase to NZ\$35 per tonne for surrenders covering 2020 emissions and then be discontinued for emissions from 2021 onward. ²⁵	Prospect of a higher price cap in the market (\$35 per unit), followed by a de facto market price cap set by NZU auction settings for which the government receives advice from the Climate Change Commission.
March 2021	Quarterly auctioning of NZUs begins. ²⁶	An auction reserve price (a form of price floor) sets a minimum price at which the government will sell units at auction and a cost containment reserve (a form of price ceiling) holds a fixed volume of NZUs that are released if the cost containment reserve trigger price is reached in the auction.

²¹ [ETS 2012 Amendments: Key Changes for Participants and Industrial Allocation Recipients \(environment.govt.nz\)](https://environment.govt.nz/ets-2012-amendments-key-changes-for-participants-and-industrial-allocation-recipients/)

²² [ETS 2012 Amendments: Biological Emissions from Agriculture in the ETS \(environment.govt.nz\)](https://environment.govt.nz/ets-2012-amendments-biological-emissions-from-agriculture-in-the-ets/)

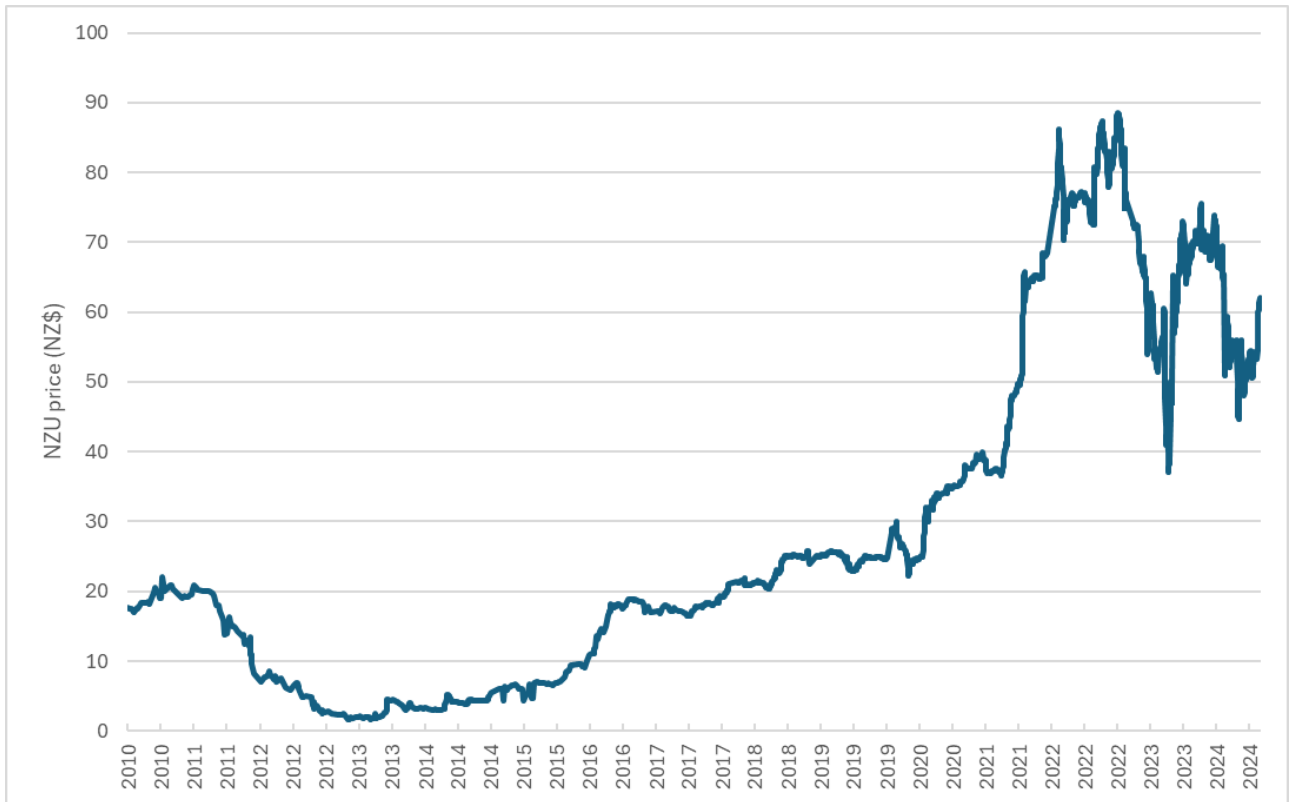
²³ [Phase out of the one-for-two transitional measure from the New Zealand Emissions Trading Scheme \(epa.govt.nz\)](https://epa.govt.nz/phase-out-of-the-one-for-two-transitional-measure-from-the-new-zealand-emissions-trading-scheme/)

²⁴ [Climate Change Response \(Zero Carbon\) Amendment Act 2019 \(environment.govt.nz\)](https://environment.govt.nz/climate-change-response-zero-carbon-amendment-act-2019/)

²⁵ [Changes to the Emissions Trading Scheme – Fixed Price Option \(epa.govt.nz\)](https://epa.govt.nz/changes-to-the-emissions-trading-scheme-fixed-price-option/)

²⁶ [Changes to the Emissions Trading Scheme since 2020 \(epa.govt.nz\)](https://epa.govt.nz/changes-to-the-emissions-trading-scheme-since-2020/)

Figure 12: NZ ETS pricing



6 Regulatory environment

Date	Event	Comments (where applicable)
New Zealand Battery Project (NZBP)		
July 2020	Labour government announces NZPB, including Lake Onslow option. ²⁷	Considerable uncertainty about the extent to which the operation of Lake Onslow would affect wholesale market price outcomes, and thus the returns on investment for new generation projects.
December 2023	National government cancels Lake Onslow pumped hydro scheme. ²⁸	
100% Renewables Target		
November 2017	Labour government announces plan to transition to 100% renewable electricity by 2035. ²⁹	Raised questions as to whether government policies were going to prioritise decarbonising the already highly renewable supply side of the sector instead of driving greater decarbonisation of the broader energy system through electrification.
September 2020	Labour government brings forward 100% renewable electricity target to 2030. ³⁰	
Decarbonisation policy		
September 2016	National government launches Low Emission Vehicles Contestable Fund (LEVCF). ³¹	These measures were “complementary” to the ETS price signal, and raised the prospect of additional electricity demand stimulation.
November 2020	Labour government launches Government Investment in Decarbonising Industry (GIDI) Fund. ³²	
June 2021	Labour government announces Clean Car Discount, providing rebates for electric and plug-in hybrid vehicles. ³³	
October 2021	Labour government launches Low Emissions Transport Fund (LETF) based on the LEVCF but with a broader scope and more funding available. ³⁴	
December 2023	National government discontinues GIDI Fund ³⁵ and Clean Car Discount. ³⁶	The removal of the Clean Car Discount has almost certainly resulted in a decrease in the number of new EVs purchased in New Zealand, which, along with the GIDI Fund’s discontinuation, will have impacts on electricity demand growth.

²⁷ [100% renewable electricity grid explored with pumped storage ‘battery’ \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/100-renewable-electricity-grid-explored-with-pumped-storage-battery)

²⁸ [Lake Onslow pumped hydro scheme scrapped \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/lake-onslow-pumped-hydro-scheme-scrapped)

²⁹ [Speech from the Throne \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/speech-from-the-throne)

³⁰ [Speech from the throne \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/speech-from-the-throne)

³¹ [Electric vehicles contestable fund opens today \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/electric-vehicles-contestable-fund-opens-today)

³² [GIDI Process Heat Contestable Fund Round 4 FAQs \(eeca.govt.nz\)](https://www.eeca.govt.nz/news/gidi-process-heat-contestable-fund-round-4-faqs)

³³ [Clean car package to drive down emissions \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/clean-car-package-to-drive-down-emissions)

³⁴ [Government puts ‘pedal to metal’ on cutting transport emissions \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/government-puts-pedal-to-metal-on-cutting-transport-emissions)

³⁵ [Proposed cost cuts and cost savings \(eeca.govt.nz\)](https://www.eeca.govt.nz/news/proposed-cost-cuts-and-cost-savings)

³⁶ [Clean Car Discount ended on 31 December 2023 \(nzta.govt.nz\)](https://www.nzta.govt.nz/news/clean-car-discount-ended-on-31-december-2023)

Date	Event	Comments (where applicable)
May 2024	National government announces \$27.75m low emission heavy vehicle fund. ³⁷	
Permitting environment		
July 2020	COVID-19 Recovery (Fast-track Consenting) Act 2020 comes into force. ³⁸	While these developments have generally intended to make things easier for generators, there has been ongoing and highly politicised reform in this area, leading to additional uncertainty as to future consenting requirements.
February 2021	Labour government announces plan to replace the Resource Management Act (RMA) with three new Acts, including the Natural and Built Environments Act (NBEA). ³⁹ This originally limited consents for small-scale hydro schemes to 10 years. ⁴⁰	
July 2023	Natural and Built Environment Bill amended after Select Committee stage so that all hydro generation (including small-scale) is exempt from the 10-year maximum consent duration requirement. ⁴¹	
December 2023	National government repeals the NBEA. ⁴²	
April 2024	Applications open for projects to be included in Schedule 2 of the new National government's Fast Track Approvals Bill. ⁴³	
September 2024	The government announces two new laws to be developed to replace the RMA. ⁴⁴ The two acts will have distinct purposes – one to manage environmental effects arising from activities, and another to enable urban development and infrastructure. A seven-strong expert panel of lawyers, planners and economists will work with officials to help develop a blueprint by December for the work.	
Planning environment		
October 2022	National Policy Statement for Highly Productive Land (NPS HPL) comes into effect, prohibiting inappropriate use of HPL.	While there was an exception for the maintenance, operation, upgrade, or expansion of specified infrastructure (which could include renewable energy projects), this did not extend to the initial construction of such infrastructure.

³⁷ [Driving the uptake of low emission heavy vehicles | Beehive.govt.nz](https://www.beehive.govt.nz/news/low-emission-heavy-vehicles)

³⁸ [Overview: Consenting under the COVID-19 Recovery \(Fast-track Consenting\) Act 2020 \(epa.govt.nz\)](https://www.epa.govt.nz/consenting/consenting-under-the-covid-19-recovery-fast-track-consenting-act-2020)

³⁹ [Resource management reform: An overview \(environment.govt.nz\)](https://www.environment.govt.nz/our-work/consenting/resource-management-reform)

⁴⁰ [Natural and Built Environment Bill s276 \(legislation.govt.nz\)](https://www.legislation.govt.nz/bills/2020/0000/0000/0000/natural-and-built-environment-bill-s276)

⁴¹ [Supplementary Order Paper No 389 \(legislation.govt.nz\)](https://www.legislation.govt.nz/other-instruments/2023/0000/0000/supplementary-order-paper-no-389)

⁴² [Natural and Built Environment Act 2023 \(environment.govt.nz\)](https://www.environment.govt.nz/our-work/consenting/natural-and-built-environment-act-2023)

⁴³ [Fast-track approval applications \(consult.environment.govt.nz\)](https://www.consult.environment.govt.nz/our-work/consenting/fast-track-approval-applications)

⁴⁴ [Govt sets next stage of RMA reform, names expert group \(energynews.co.nz\)](https://www.energynews.co.nz/news/govt-sets-next-stage-of-rma-reform-names-expert-group)

Date	Event	Comments (where applicable)
September 2024	NPS HPL amendments come into force. ⁴⁵	Exception now also applies to construction of specified infrastructure.
Overseas Investment Act		
November 2021	Stronger Overseas Investment Office requirements come into force around the advertising of farmland. ⁴⁶	There was initial uncertainty as to whether exemptions would be granted for solar farms, which may have delayed some projects.
July 2022	Overseas Investment Office grants first advertising exemption for purchase of farmland for solar farm. ⁴⁷	

⁴⁵ [Changes to the NPS HPL are due to come into effect soon \(al.nz\)](#)

⁴⁶ [New overseas investment rules take effect this month \(bellgully.com\)](#)

⁴⁷ [Register: Exemptions from farm land advertising requirements \(linz.govt.nz\)](#)

7 Wholesale price and cost of new supply

Relatively sustained wholesale prices above the cost of new generation supply incentivises new generation investment.

In the last five years or so, wholesale prices have exceeded the estimated long run marginal cost (LRMC) of new generation.⁴⁸ Prices first rose sharply in 2018 in response to unexpected reductions in gas output at Pohokura. Ongoing challenges with domestic gas production have continued to weigh on electricity pricing as shown in Figure 13.

This has resulted in considerable interest in new generation investment, as seen in Transpower's grid connection enquiries over time (Figure 14) and the future build we have documented in Section 3. However, new projects and grid connections to enable them have relatively long lead times. A "small, standard project" can take 18 months to connect to the grid, whilst a "large, complex project" can take circa three years or more.⁴⁹

Prior to 2018, wholesale prices rarely moved significantly above the estimated costs of new baseload supply.

⁴⁸ [Generation Investment Survey 2023 \(ea.govt.nz\)](https://www.ea.govt.nz/generation-investment-survey-2023/)

⁴⁹ [Our connection process \(transpower.co.nz\)](https://www.transpower.co.nz/our-connection-process/)

Figure 13: Electricity market spot prices

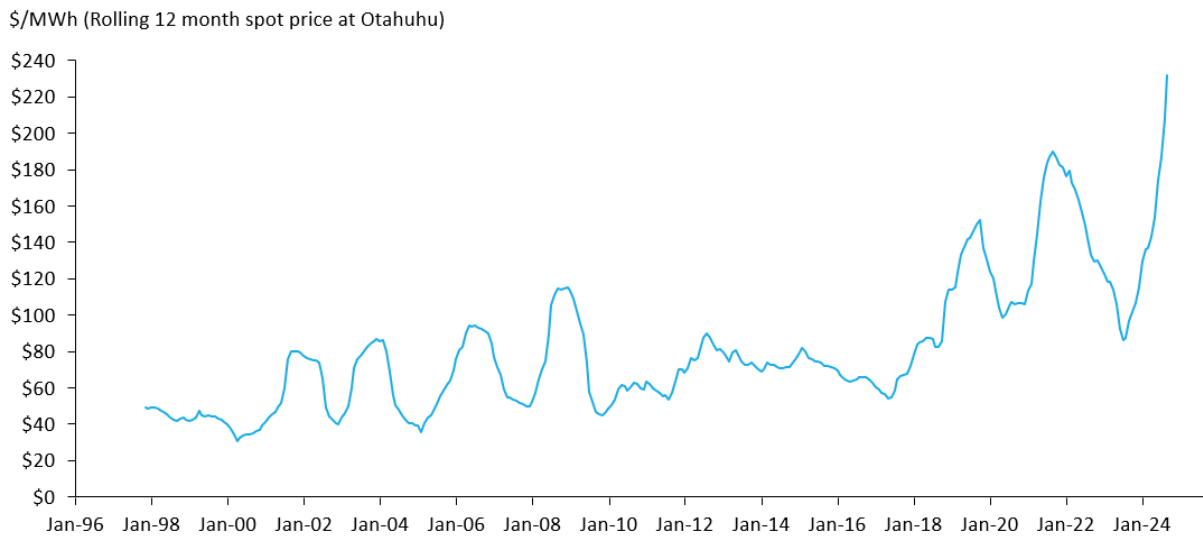
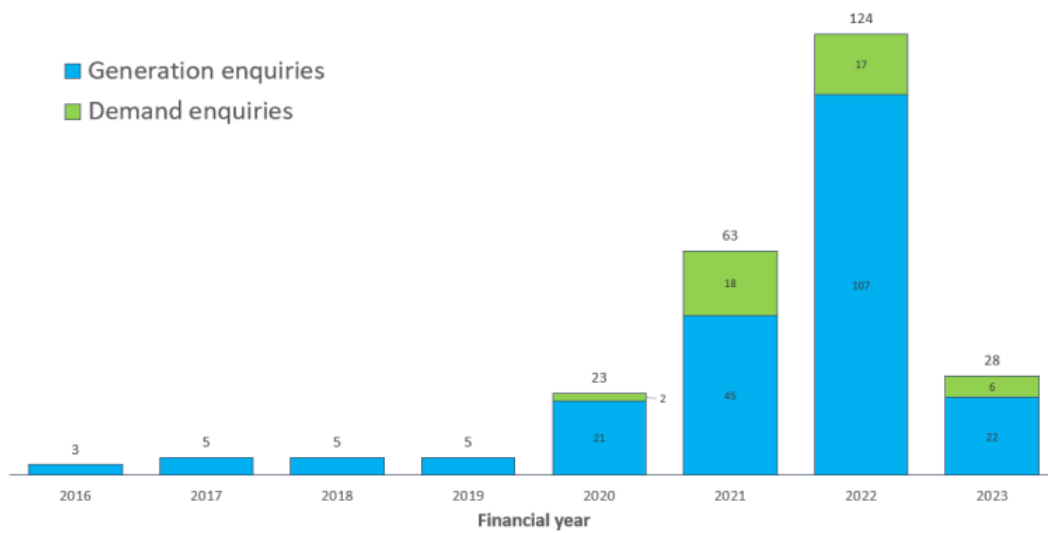


Figure 14: Transpower grid connection enquiries over time⁵⁰



⁵⁰ [Connections Management Framework \(transpower.co.nz\)](https://www.transpower.co.nz/connections-management-framework)

8 Gas market developments

Date	Event	Comments (where applicable)
Gas supply		
January 2003	Maui field redetermination significantly downgrades New Zealand's reserves. ⁵¹	Resulted in gas shortage until new fields started production.
September 2006	Pohokura field starts production. ⁵²	
March 2010	Kupe field starts commercial production. ⁵³	
April 2018	Labour government announces ban on new offshore oil and gas exploration. ⁵⁴	
March-July 2018	Pohokura experiences unexpected reductions in output. ⁵⁵	
2022 & 2024	Significant drilling campaigns fail to develop expected reserves across all 'big-6' fields. Major reduction in deliverability and reported remaining gas reserves and resources. ⁵⁶	
June 2024 (signalled earlier)	National government announces removing oil and gas exploration ban, as well as other measures to increase investment. ⁵⁷	
Winter 2024	Low deliverability coincides with dry winter and tight electricity supply.	Resulted in extreme gas and electricity prices.
Methanex demand		
December 2004	Methanex mothballs Motunui plant. ⁵⁸	
October & November 2008	Methanex restarts first Motunui train (and mothballs Waitara Valley plant). ⁵⁹	
July 2012	Methanex restarts second Motunui train. ⁶⁰	
October 2013	Methanex restarts Waitara Valley plant. ⁶¹	
April 2021	Methanex mothballs Waitara Valley plant. ⁶²	
August & September 2024	Methanex temporarily mothballs both Motunui trains to on-sell gas ⁶³ (and proposes continuing to mothball one train indefinitely). ⁶⁴	

⁵¹ [Redetermination of Maui gas reserves \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/redetermination-of-maui-gas-reserves)

⁵² [The Pohokura Gas Field, New Zealand \(offshore-technology.com\)](https://www.offshore-technology.com/news/the-pohokura-gas-field-new-zealand/)

⁵³ [Kupe joint venture \(genesisenergy.co.nz\)](https://www.genesisenergy.co.nz/news/kupe-joint-venture)

⁵⁴ [Planning for the future - no new offshore oil and gas exploration permits \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/planning-for-the-future-no-new-offshore-oil-and-gas-exploration-permits)

⁵⁵ [Gas production and consumption \(gasindustry.co.nz\)](https://www.gasindustry.co.nz/news/gas-production-and-consumption)

⁵⁶ [Gas production forecast to fall below demand \(mbie.govt.nz\)](https://www.mbie.govt.nz/news/gas-production-forecast-to-fall-below-demand)

⁵⁷ [Government to reverse oil and gas exploration ban \(beehive.govt.nz\)](https://www.beehive.govt.nz/news/government-to-reverse-oil-and-gas-exploration-ban)

⁵⁸ [Methanex restarts Motunui methanol unit \(energynews.co.nz\)](https://www.energynews.co.nz/news/methanex-restarts-motunui-methanol-unit)

⁵⁹ [Methanex restarts Motunui methanol unit \(energynews.co.nz\)](https://www.energynews.co.nz/news/methanex-restarts-motunui-methanol-unit)

⁶⁰ [Methanex Completes the Restart of a Second Plant in New Zealand \(methanex.com\)](https://www.methanex.com/news/methanex-completes-the-restart-of-a-second-plant-in-new-zealand)

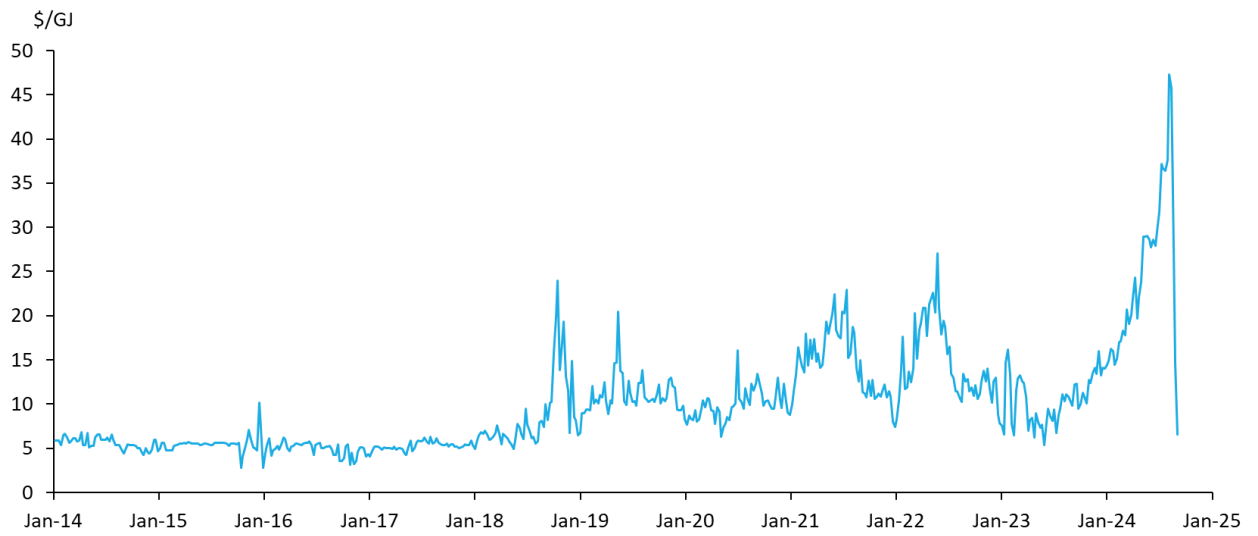
⁶¹ [Methanex reopens Waitara plant, returning to full NZ production \(energynews.co.nz\)](https://www.energynews.co.nz/news/methanex-reopens-waitara-plant-returning-to-full-nz-production)

⁶² [Methanex running NZ operations at two-thirds capacity \(energynews.co.nz\)](https://www.energynews.co.nz/news/methanex-running-nz-operations-at-two-thirds-capacity)

⁶³ [Methanex Corporation to Temporarily Idle New Zealand Operations to Assist in Improving Energy Balances \(methanex.com\)](https://www.methanex.com/news/methanex-corporation-to-temporarily-idle-new-zealand-operations-to-assist-in-improving-energy-balances)

⁶⁴ [Another blow for industry: Methanex proposes idling one plant indefinitely, job cuts \(nzherald.co.nz\)](https://www.nzherald.co.nz/business/news/methanex-proposes-idling-one-plant-indefinitely-job-cuts/)

Figure 15: Gas market spot prices



As shown above, spot gas prices since the 2018 Pohokura output reduction have been extremely volatile.

9 Transmission

9.1 New transmission investment

The high voltage transmission grid is essential to connecting new generation projects with demand centres. Major transmission upgrades on the core interconnected grid backbone can create more certainty for new generation investment (i.e., by reducing the risk that such generation would be constrained and/or face low wholesale market prices) but such investments have long lead times and are subject to regulatory approvals.

Date	Event	Comments (where applicable)
North Island Grid Upgrade (NIGU)⁶⁵		
October 2004 – July 2007	The project faced well organized and vocal opposition ever since Transpower expressed its intent to develop it in 2004. The first investment proposal was submitted to regulators in 2005, with a revised proposal being approved in 2007.	The project created vastly increased transmission capacity between the central North Island and Auckland, improving the ability for generation south of the upper North Island to compete in the market to supply load in Auckland and further North.
September 2009	RMA approvals were granted in 2009.	
January 2010 – October 2012	Construction and commissioning.	
HVDC Upgrades⁶⁶		
July 2008	The pole 3 project (to replace pole 1, which had been ailing since 2007) was approved.	The project allowed increased interisland power transfers. In particular, it made it easier for both existing and new generation in the South Island to serve the major North Island load centres.
2010 – 2013	Site works commencement to commissioning of pole 3. Pole 3 was operating a year later than anticipated due to manufacturer delays.	
Late 2013	The existing Pole 2's control system was replaced in order to function best with the new Pole 3.	
Early 2014	A STATCOM commissioned at Haywards allowed the new HVDC link to operate at a full 1,200 MW capacity.	
Wairakei – Whakamaru C line project		
2009	The project received regulatory approval in 2009. ⁶⁷	The project was an essential enabler for new central North Island geothermal generation (e.g., Ngatamariki and Te Mihi projects.)
July 2014	Project commissioned – about a year later than planned. ⁶⁸	
Lower South Island renewables project		

⁶⁵ [North Island Grid Upgrade project \(comcom.govt.nz\)](http://comcom.govt.nz)

⁶⁶ [HVDC link on track for full commercial use next week \(energynews.co.nz\)](http://energynews.co.nz)

⁶⁷ [Transpower welcomes approval for Wairakei Ring Reinforcement project - NS Energy \(nsenergybusiness.com\)](http://nsenergybusiness.com)

⁶⁸ [Wairakei-Whakamaru 'C' Line Commissioned \(treasury.govt.nz\)](http://treasury.govt.nz)

Date	Event	Comments (where applicable)
2010	Received regulatory approval, ⁶⁹ but the anticipated new generation commitments in the region did not eventuate. The project was largely shelved.	The project largely concerned the upgrade of five transmission lines between Roxburgh and the Waitaki Valley. This supports new generation investment in the lower South Island as well as the transfer of excess South Island hydropower to the upper South Island and beyond.
2019	It became clear that the lower South Island grid could become severely constrained following the looming exit of NZAS. The project was revived and expedited.	
2022	The project works were completed ahead of schedule. ⁷⁰	
North Auckland and Northland (NAaN) project		
April 2009	The project receives regulatory approval, almost two years after Transpower's first application in September 2007.	The project reinforced transmission into Auckland and across the harbour to North Auckland and Northland.
October 2010	Cable installation is planned to begin. ⁷¹	
Feb 2014	Project completion. ⁷²	

9.2 Transmission Pricing Methodology

Transmission charges are recovered from transmission customers in accordance with the Transmission Pricing Methodology (TPM), which is set by the Electricity Authority.

Date	Event	Comments (where applicable)
June 2011	Electricity Authority publishes first discussion paper, proposing that the TPM become more oriented towards a beneficiaries-pay methodology. ⁷³	The way transmission grid costs are recovered through the TPM has long been controversial. Recent TPM reforms have taken over a decade. On one hand, the reforms promised fairer and more efficient pricing for some generation owners and investors (e.g., those in the South Island who had historically borne the burden of paying for the HVDC link). On the other hand, the protracted process and uncertain outcomes also may have discouraged investment to some extent in conjunction with other factors.
July 2019	Following years of intense debate and consultation processes across the entire electricity sector, the Electricity Authority releases a TPM issues paper. ⁷⁴	
June 2020	TPM decision paper is announced, ⁷⁵ followed by guidelines to Transpower. ⁷⁶	
October – December 2021	Transpower releases a proposed TPM, which the Electricity Authority consults on. ⁷⁷	

⁶⁹ [Transpower given go-ahead for \\$170 million lower South Island upgrade | Energy News](#)

⁷⁰ [CUWLP commissioning expected in 5 weeks | Energy News](#)

⁷¹ [Transpower's Auckland and Northland upgrade project gearing up | Energy News](#)

⁷² [Transpower's NAaN goes live, under budget - Andrew | Energy News](#)

⁷³ [Transmission pricing discussion paper \(ea.govt.nz\)](#)

⁷⁴ [2019 issues paper \(ea.govt.nz\)](#)

⁷⁵ [Transmission pricing methodology 2020 Guidelines and process for development of a proposed TPM \(ea.govt.nz\)](#)

⁷⁶ [Transmission pricing methodology 2020 Guidelines \(ea.govt.nz\)](#)

⁷⁷ [Proposed new transmission pricing methodology \(ea.govt.nz\)](#)

Date	Event	Comments (where applicable)
April 2022	Electricity Authority issues final decision paper confirming new TPM. ⁷⁸	
April 2023	New TPM comes into force. ⁷⁹	

⁷⁸ [Transmission Pricing Methodology 2022 Decision Paper \(ea.govt.nz\)](https://www.ea.govt.nz/decisions/2022/04/2022-04-20-tpm/)

⁷⁹ [Commencement of the new Transmission Pricing Methodology \(ea.govt.nz\)](https://www.ea.govt.nz/decisions/2023/04/2023-04-20-tpm/)

11 Assumptions

- In general, our historical pipeline data pertain to generation dispatched by the system operator and/or generation above 10 MW in capacity. However, we have made efforts to capture as much other generation as reasonably possible.
- Historical pipeline data have been sourced from the Electricity's EMI and numerous publicly available sources.
- Future pipeline data have been sourced from numerous publicly available sources, collated and vetted through extensive Concept analysis.
- Joint venture equity shares are not calculated for projects – the whole project is generally assigned to the more established industry participant shareholder.