Market Operations Weekly Report - Week Ended 12 October 2025

Overview

New Zealand hydro storage increased to 115% of the historic mean last week as inflows continued across the motu. Demand continues to ease with warmer spring weather.

This week's insight looks at variability of solar generation output and discusses its consequences for management of grid security.

Security of Supply

Energy

Inflows across the motu last week resulted in national hydro storage levels increasing to 115% of the historic mean from 108% the week prior. South Island hydro storage increased from 104% to 112% of historic mean and North Island storage increased from 132% to 135%.

Capacity

While capacity residual margins were high for most of last week, residual dropped to 304 MW on the morning of Monday 6 October. This was the highest demand peak for the week and coincided with a period of low wind generation. We continue to monitor capacity closely during the spring shoulder season despite decreasing demand. Outages, reduced thermal unit commitment, and the possibility of cold snaps or large swings in wind generation mean that capacity can be tight despite much lower peaks than in winter.

The N-1-G margins in the NZGB forecast are healthy through to the end of November. Within seven days we monitor these more closely through the market schedules. The latest NZGB report is available on the NZGB website.

Electricity Market Commentary

Weekly Demand

Total demand last week decreased from 778 GWh the week prior to 750 GWh, reflecting warmer temperatures across the motu and lower school holiday demand. Total demand is similar to that observed at this time of year over the past three years. The highest demand peak at 5,744 MW occurred at 8:00 am on Monday 6 October.

Weekly Prices

The average wholesale electricity spot price at Ōtāhuhu last week decreased to $34/MWh from $65/MWh the week prior in line with higher than average wind generation and increased hydro storage. There were long periods of very low pricing throughout the week, particularly on Friday and the weekend.

Wholesale prices peaked at $1,192/MWh at Ōtāhuhu at 8:00am on Monday 6 October during the highest peak of the week when wind generation was low and high priced thermal peaking generation was required. Sustained instantaneous reserve prices spiked in both islands at the same time. The market currently has high hydro storage, low average prices, low thermal unit commitment, and increased generation outages during the spring shoulder season. Periods like this can be prone to price volatility.

Generation Mix

Renewable generation contributed 98% of the generation mix last week. Wind generation increased its share of the mix from 10% to 16% of the mix, above its average contribution of 9%. Hydro generation decreased to 59% of the mix from 62% the week prior but remains above its average contribution, at 56% of the generation mix. Thermal generation decreased from 3% to 1% reflecting lower demand, high wind and hydro generation, and a shutdown of Huntly unit 5 to make gas available to other commercial and industrial users. The geothermal share decreased to 21% of the mix, below its average level of 23%.

HVDC

HVDC flow last week was predominantly northward with the exception of some very brief overnight periods of low southward flow. These periods coincided with periods of high wind generation and lower North Island demand. In total, 47 GWh were transferred north and 1 GWh was transferred south.

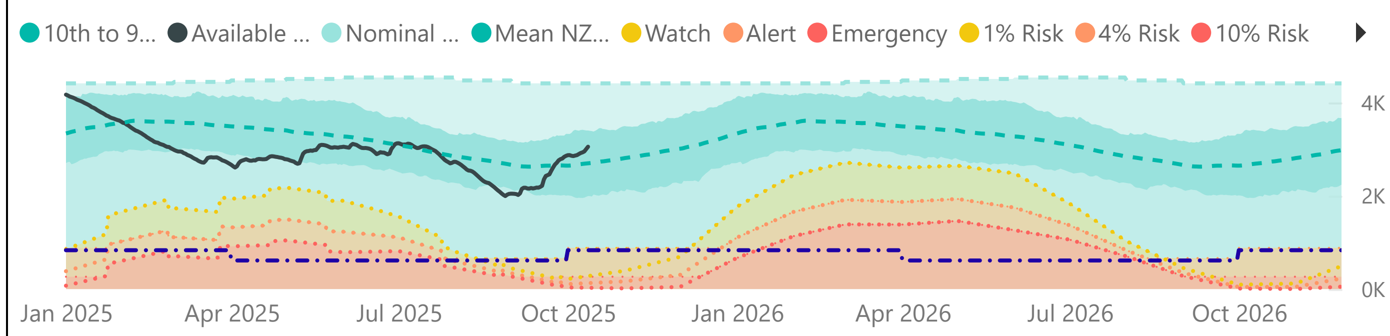
SOSFIP Consultation Open

Consultation on a draft amendment to the System Operator Forecasting and Information Policy (SOSFIP) is now open. The closing date for submissions is 5pm on Tuesday 4 November 2025, with cross-submissions due by 5pm on Tuesday 11 November 2025.

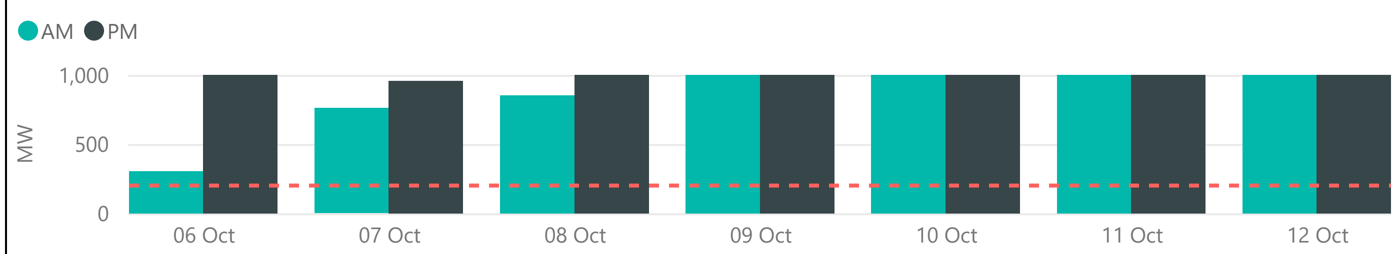
New Zealand Energy Risk

South Island Energy Risk

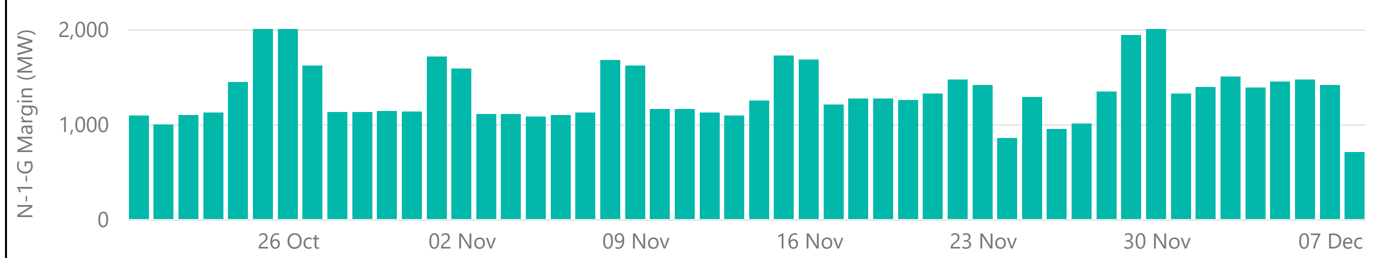
New Zealand Electricity Risk Status Curves (Available GWh)



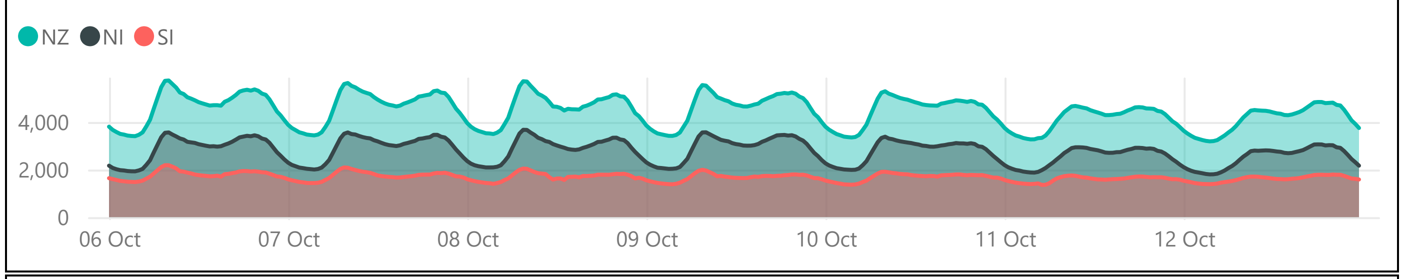
Lowest Residual Points - MW



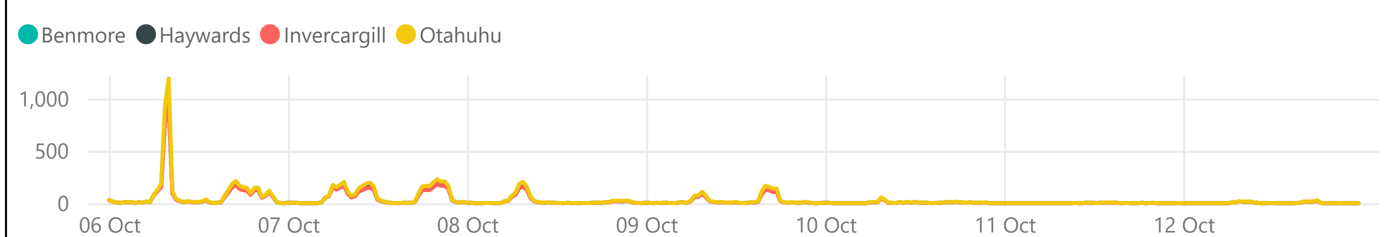
NZGB Look-Ahead (excluding next 7 days)



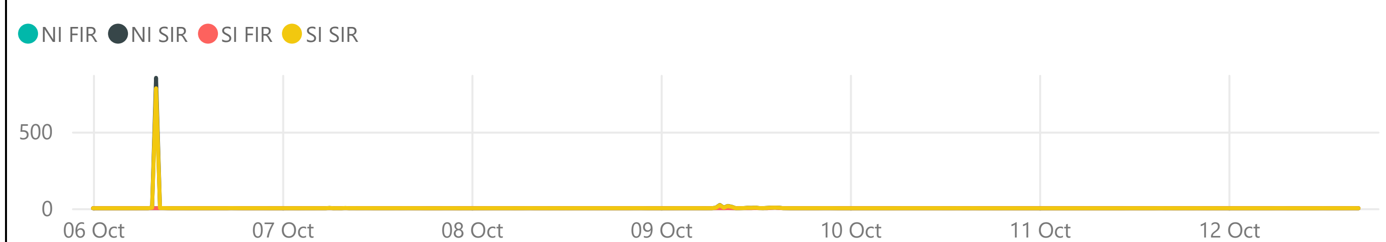
National Demand by Trading period - MW



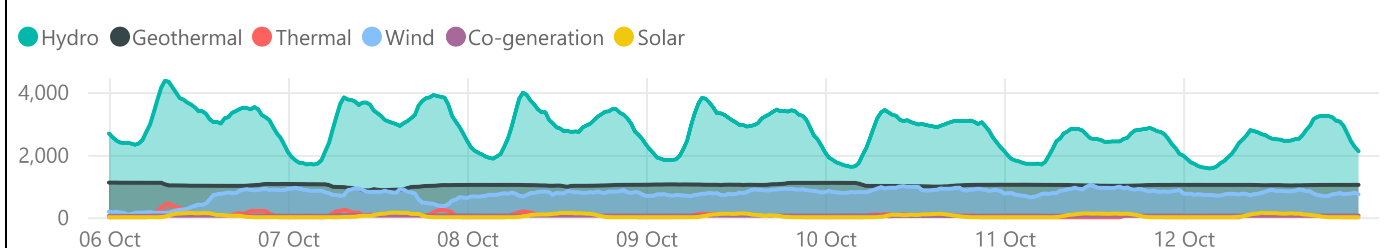
Energy Prices - $/MWh



Reserve Prices - $/MW



Generation - MW



Net HVDC Transfer - MW (Northward positive)

Weekly Insight - Significant solar fluctuations on the system

Northland currently has 55 MW of installed grid-scale solar capacity, more than any other region. This is due to increase to 96 MW by early 2026. If planned projects are delivered to schedule, this could increase to over 200 MW by the end of 2026.

The output of this generation can be very volatile at short timescales. This can cause issues with management of grid security and voltage in the region. This is similar to the issue of wind generation fluctuations that we highlighted in [our 6 July Weekly Insight](), except that fluctuations in solar output can happen much more quickly than for wind. These fluctuations are driven primarily by cloud cover, and can be extreme if two or more solar farms experience changes in cloud cover concurrently. Volatility is increased if individual solar farms are large or if solar farms are located close to each other.

Figure 1 below left shows the 15 largest changes in solar generation within a 5-minute period that have been observed in Northland since the start of 2025. During this period, installed solar generation in Northland has increased from 30 MW to 55 MW. The two largest swings were observed on 31 August and are shown in Figure 2, below right. Between 13:49 and 13:54, solar output dropped by 34 MW. This is an equivalent drop in generation to a tripping of the Ngawha B geothermal power station.

Due to the causes of these fluctuations and the short timescales on which they can occur, it is not realistic to forecast them. They therefore require real time management by the National Coordination Centre, who have also helped prepare this insight.

Figure 1: 15 largest changes in Northland solar output with a 5-minute period, 2025 to date
Total installed capacity: 55 MW

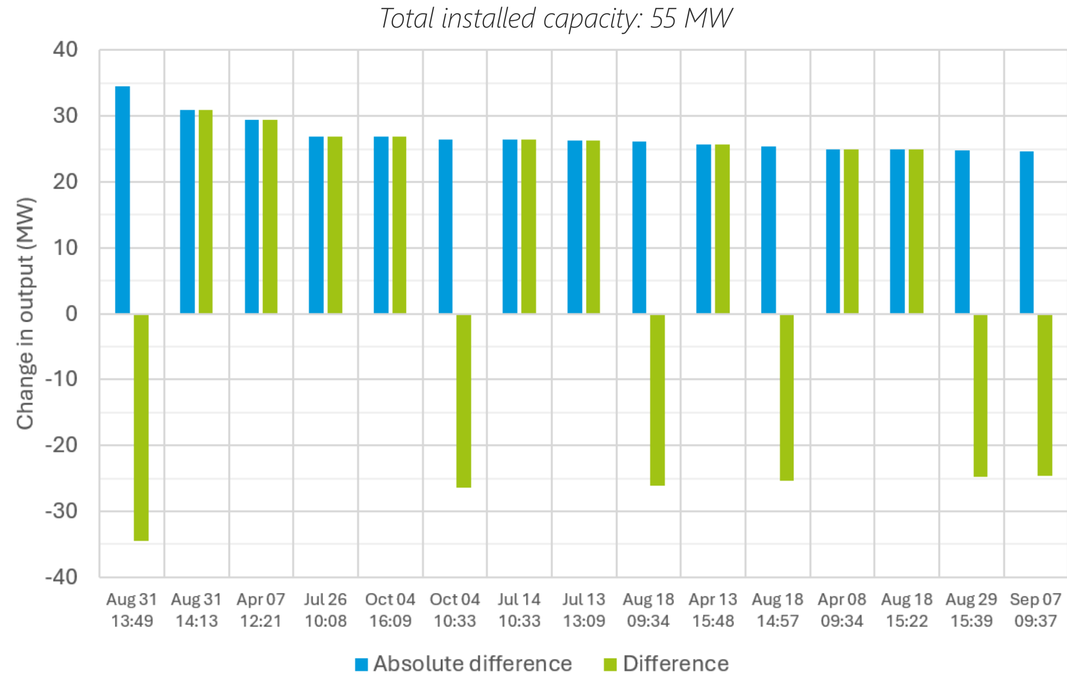
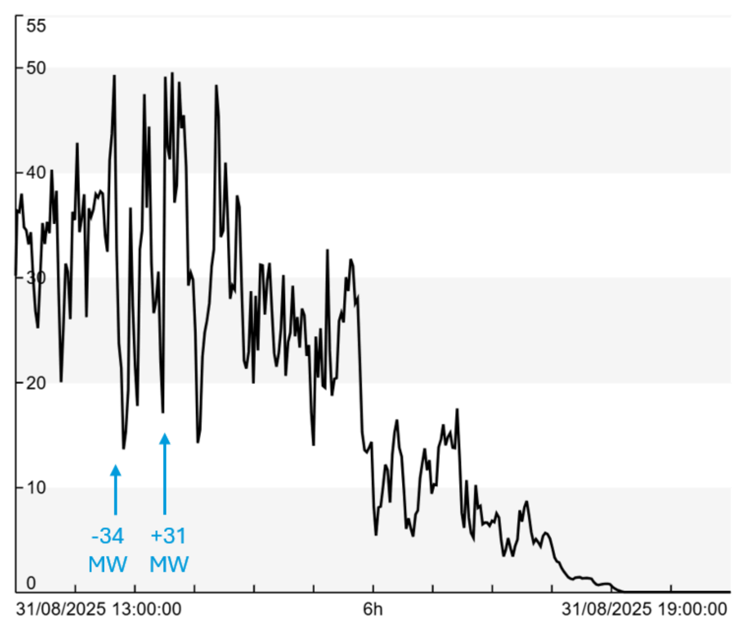


Figure 2: NZ total solar generation, 31 August 2025



Fluctuations in solar generation can also cause challenges for frequency management. Unlike voltage which can vary by region, frequency depends on the supply and demand balance across the entire grid.

Current installed solar capacity in Aotearoa is 160 MW. This is due to rise to over 220 MW by early 2026. If planned projects are delivered to schedule, this could increase to over 700 MW by the end of 2026.

At a national scale, total solar generation is less volatile relative to total installed capacity than for Northland. This is due to the greater number of solar farms and their greater geographic diversity. However the magnitude of solar generation fluctuations is still significant, and will become more so with much larger solar farms being built and solar becoming a larger part of the generation mix.

Figure 3 below left shows the 15 largest changes in total solar generation within a 5-minute period that have been observed nationally since the start of 2025. During this period, installed solar generation has increased from 116 MW to 160 MW. The largest swing was observed on 29 August and is shown in Figure 4, below right. Between 09:31 and 09:35, solar output dropped by 58 MW. This is roughly twice the range of the ±15 MW frequency keeping band that is intended to regulate frequency within 5-minute dispatch periods. Had the NI and SI frequency keepers been in the midpoint of this range, i.e. system frequency was close to 50Hz, this change is almost twice the available frequency keeping capacity available to offset system variability intra-dispatch.

Figure 3: 15 largest changes in NZ solar output with a 5-minute period, 2025 to date
Total installed capacity: 160 MW

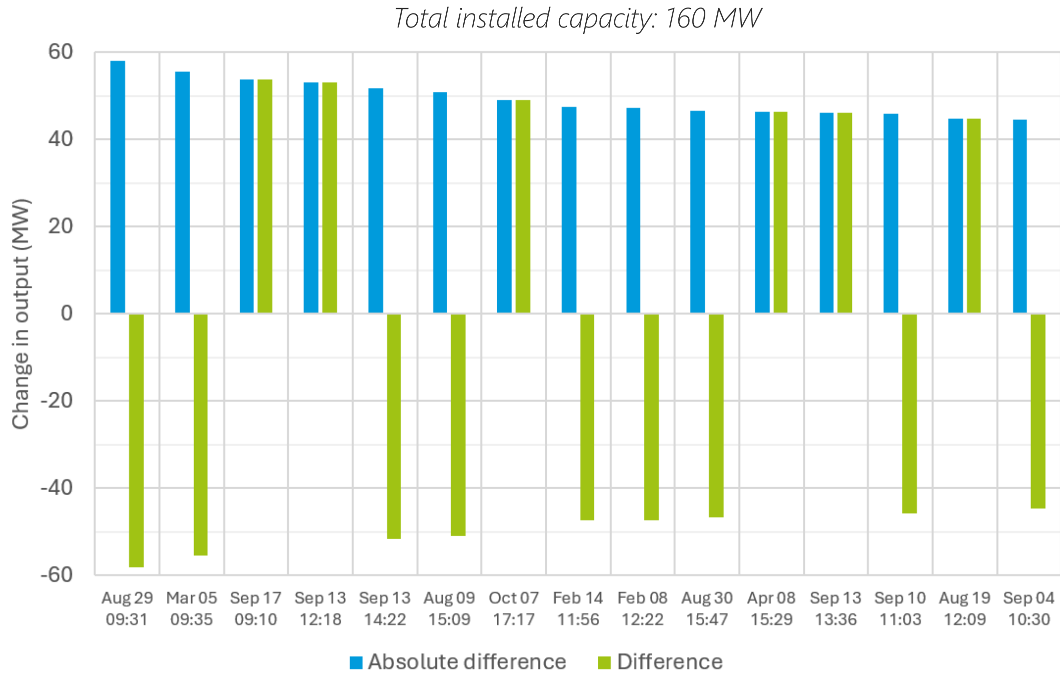
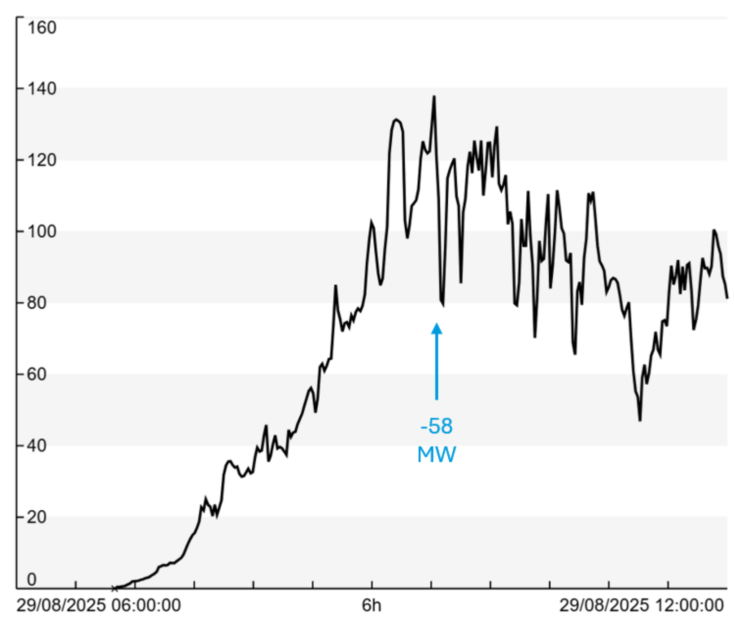


Figure 4: NZ solar generation, 29 August 2025



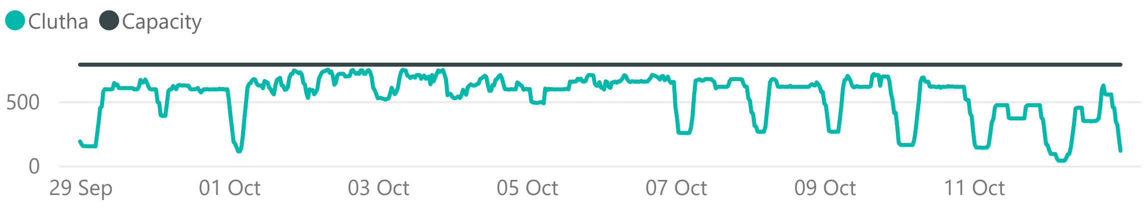
System frequency is supported by the performance of the Asset Owner Performance Obligations (AOPO) placed in the 'Common Quality' sections of the Code (Part 8). All generators subject to the frequency AOPO's must support frequency management within the normal band (49.8 – 50.2 Hz). As a result, system frequency deviations do not yet arise from solar fluctuations. However, the frequency keeper and AOPO response are effectively finite resources, the capability of which could be exceeded in future by the system's increasing intermittent generation fleet.

Batteries are a potential way of managing frequency and voltage with these large and sudden changes in solar generation output. The current market system is not designed to dispatch batteries on the short timescales that would be required, but the Electricity Authority is working on regulatory changes to help address these issues. See for example the Battery Energy Storage Systems Roadmap. The changing power system and its impacts on managing voltage and frequency are being worked on under the Future Security and Resilience work program.

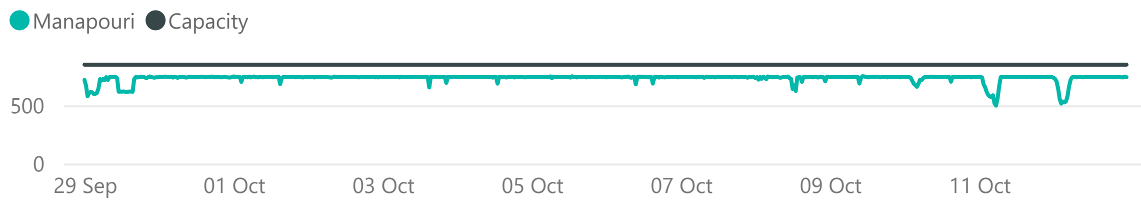
Generation Breakdown - Last Two Weeks

Measured in MW and displayed at trading period level for last 14 days

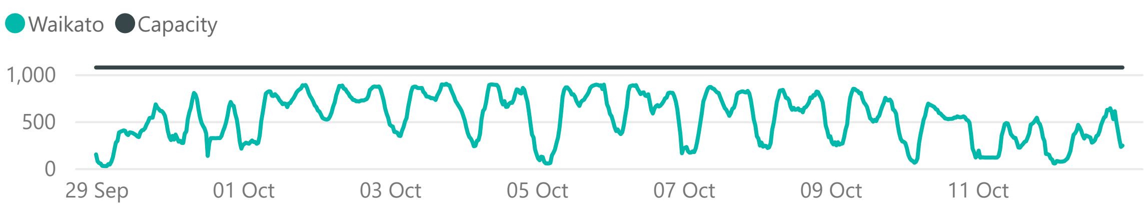
Clutha



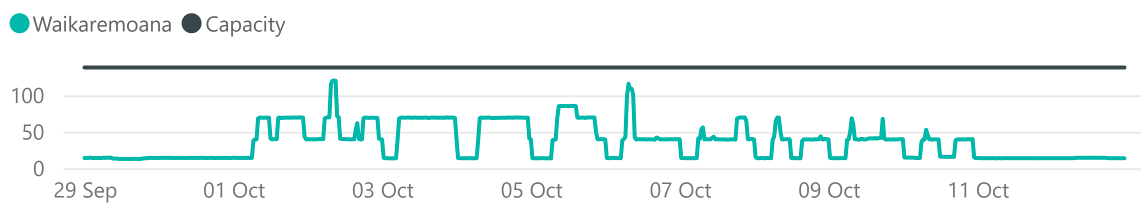
Manapouri



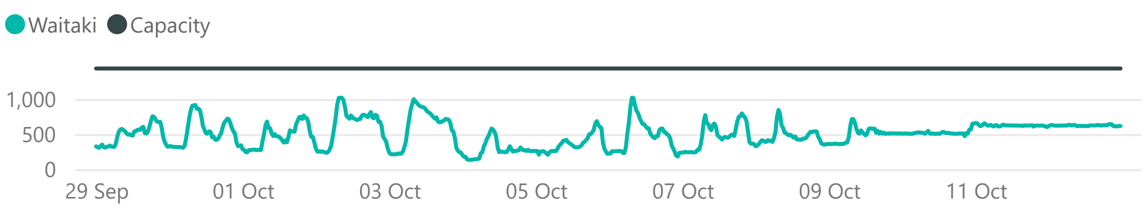
Waikato



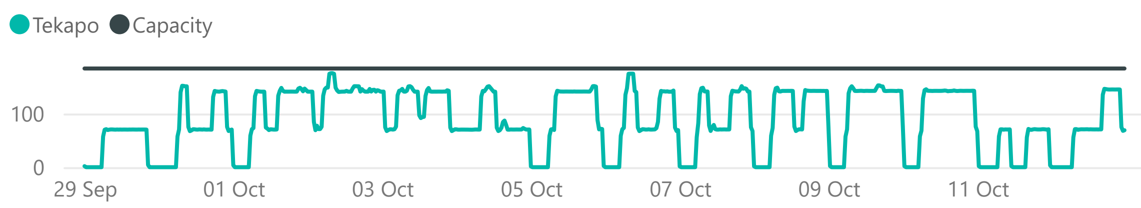
Waikaremoana



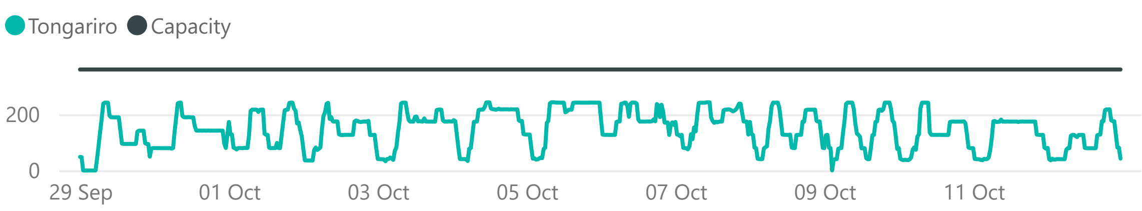
Waitaki



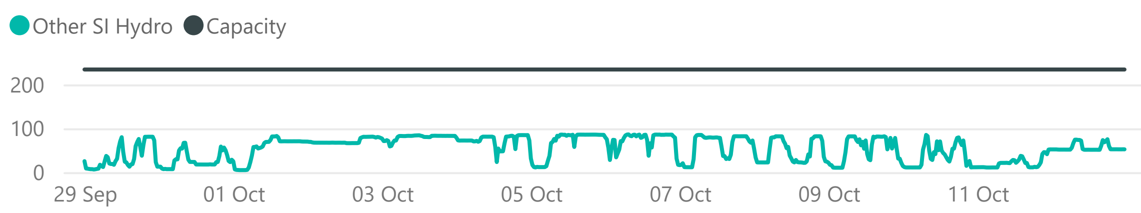
Tekapo



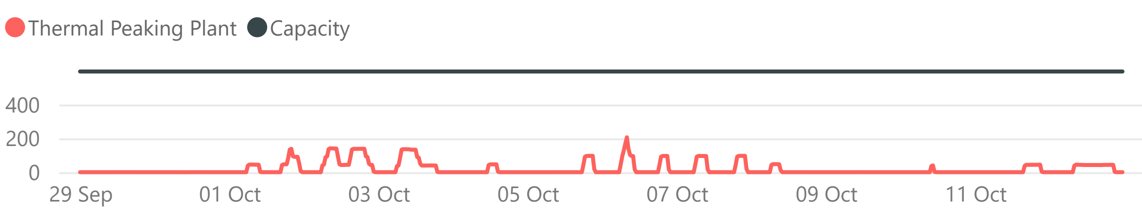
Tongariro



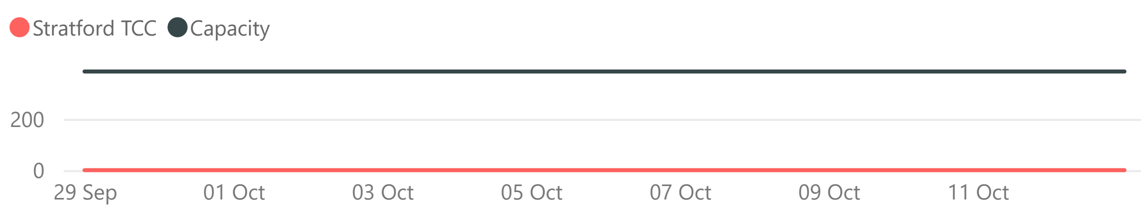
Other SI Hydro



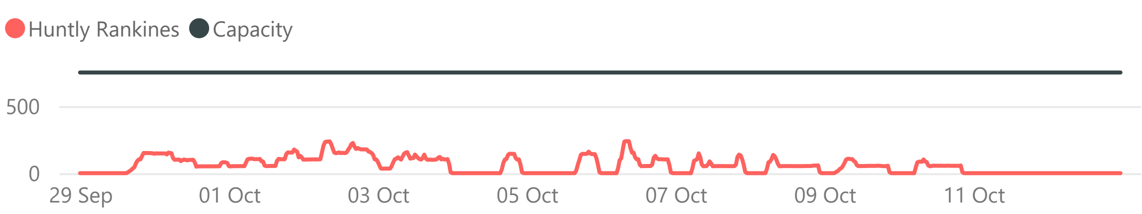
Thermal Peaking Plant



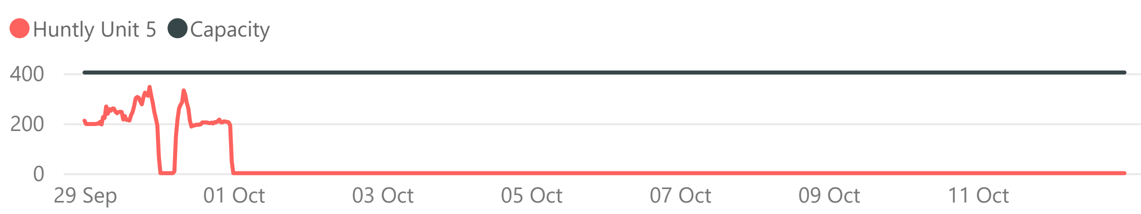
Stratford TCC



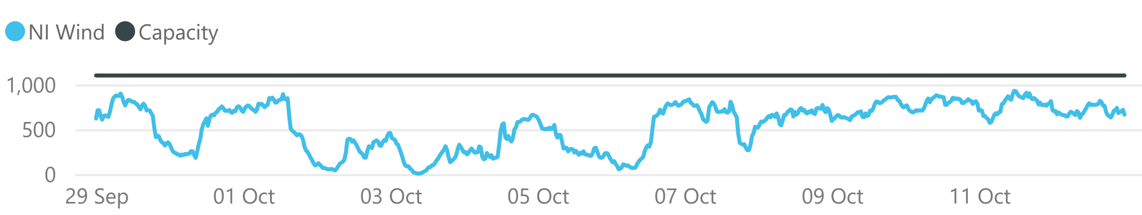
Huntly Rankines



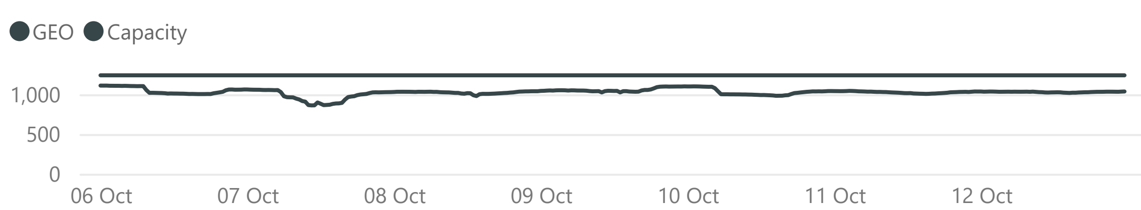
Huntly U5



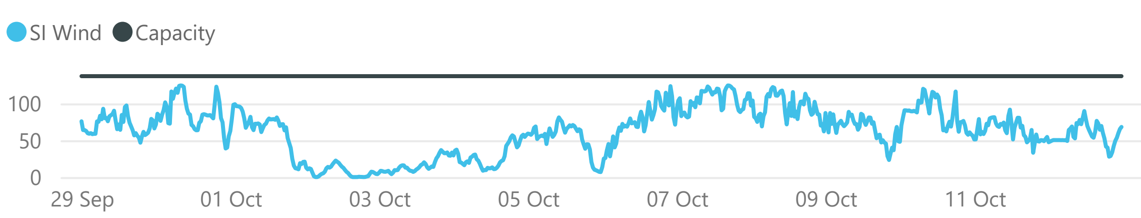
North Island Wind



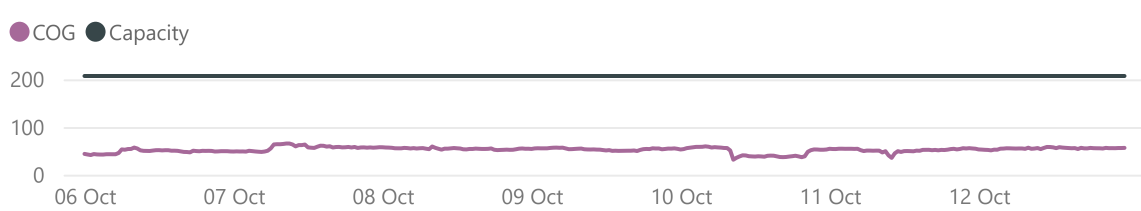
Geothermal



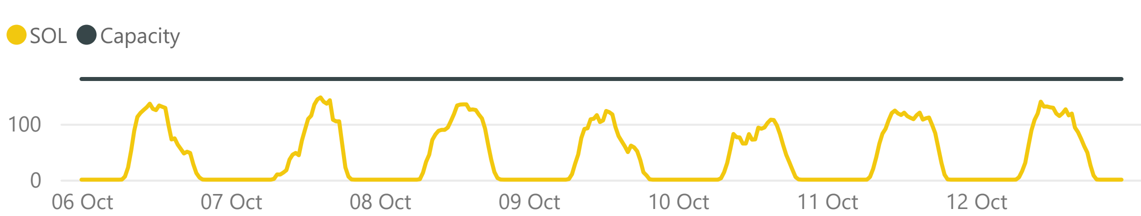
South Island Wind



Co-Generation

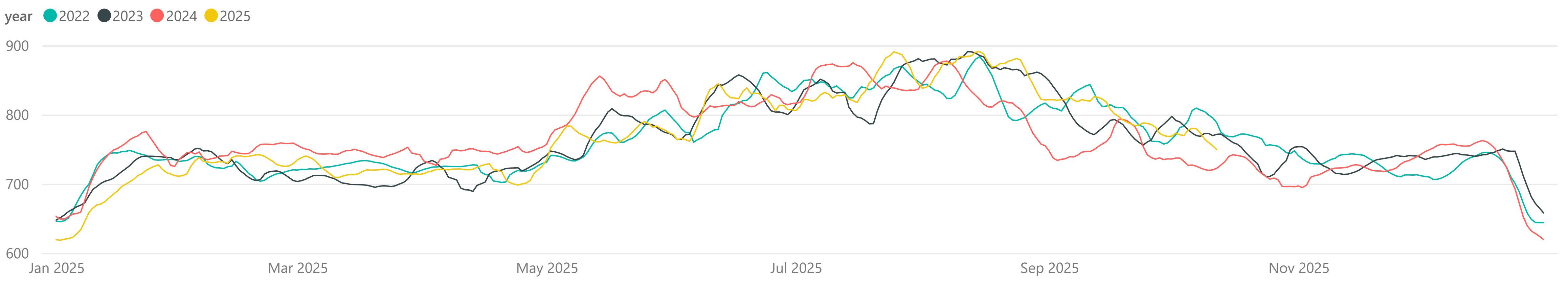


Solar

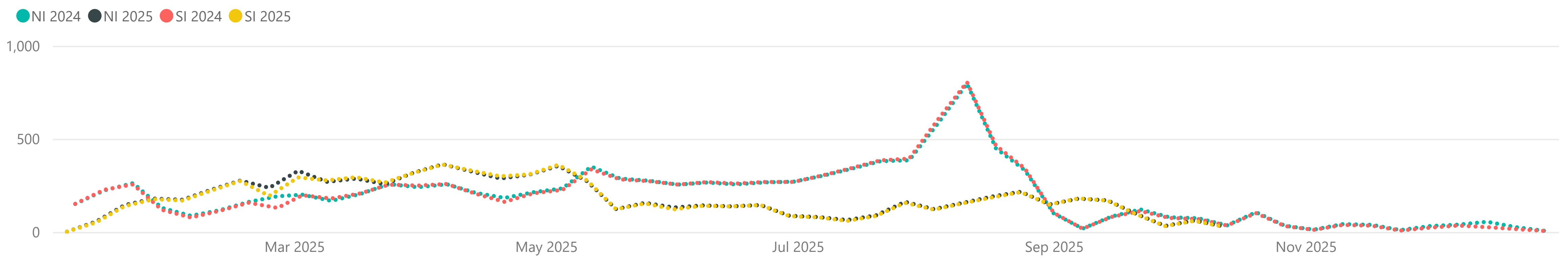


Weekly Profiles

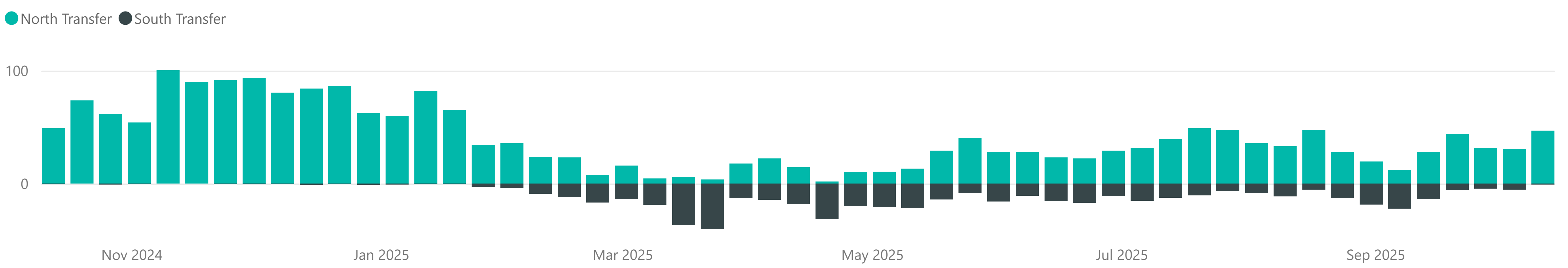
National Weekly Demand - GWh - 7 Day Rolling



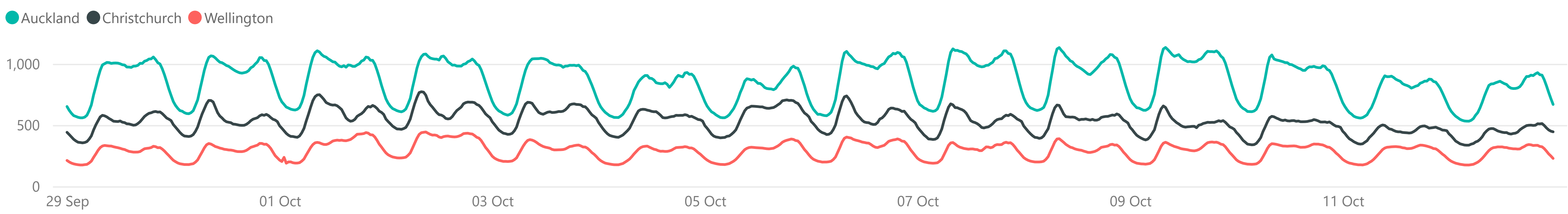
Weekly Spot Price - $/MWh



HVDC Transfer - Weekly GWh

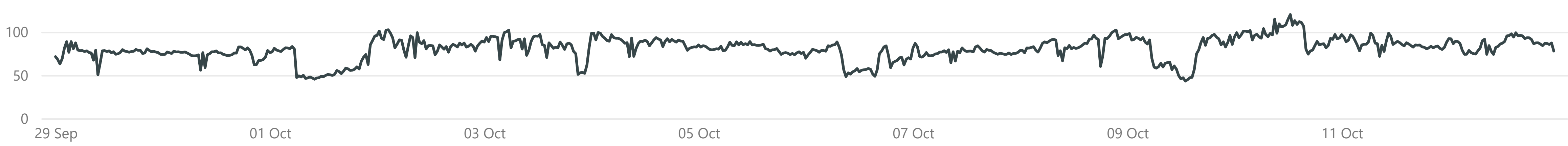


Conforming Load Profiles - Last Two Weeks *Measured in MW shown by region*

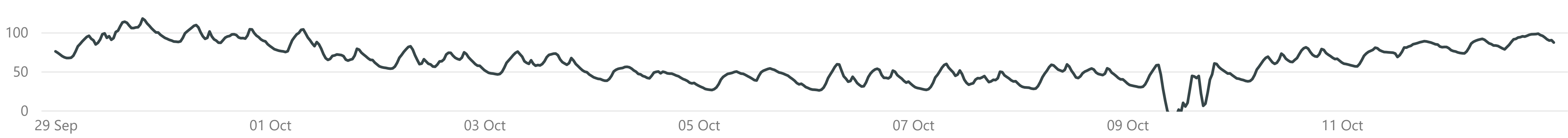


Non-Conforming Load Profiles - Last Two Weeks *Measured in MW shown by GXP*

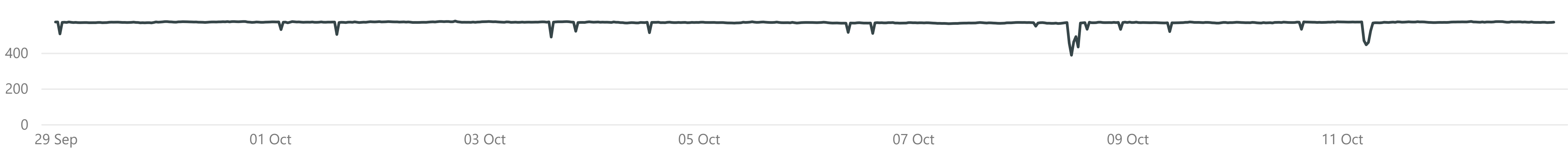
GLN0331



ASB0661



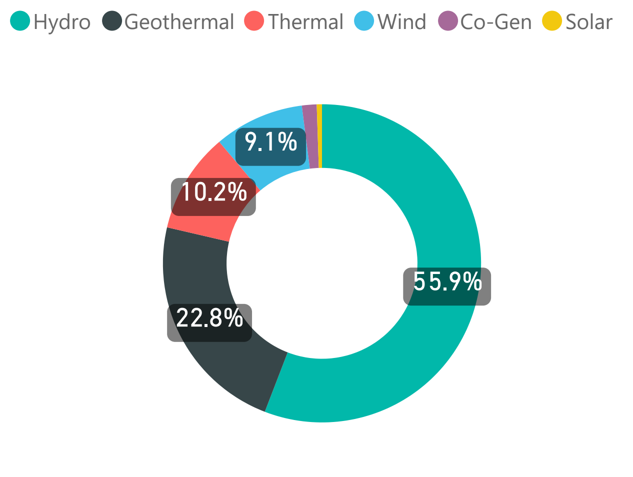
TWI2201



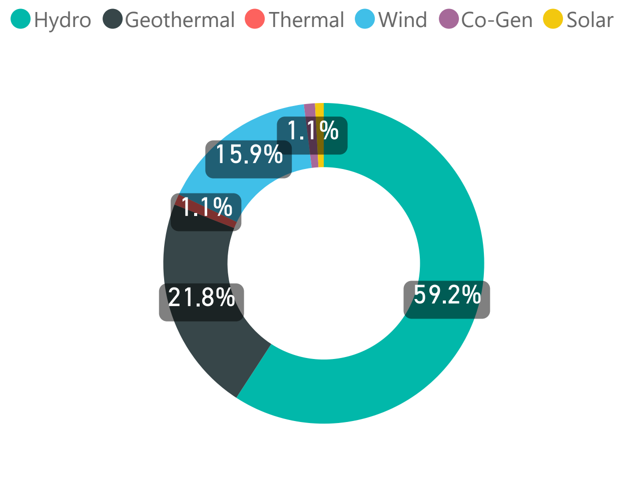
TRANSPOWER

Generation Mix

Last 52 Weeks Generation Mix - Weekly GWh



Last 7 Days Generation Mix - Weekly GWh



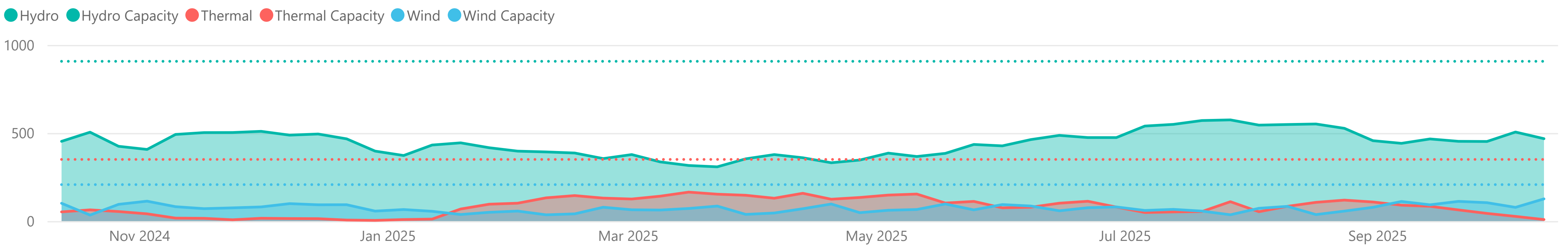
Average Metrics Last 7 Days

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
98%	23,100	28.9

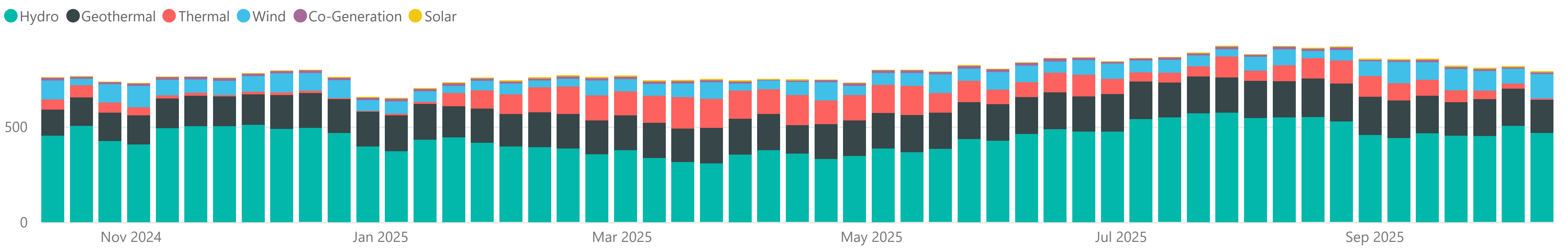
Average Metrics Last 52 Weeks

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
88%	66,613	84.0

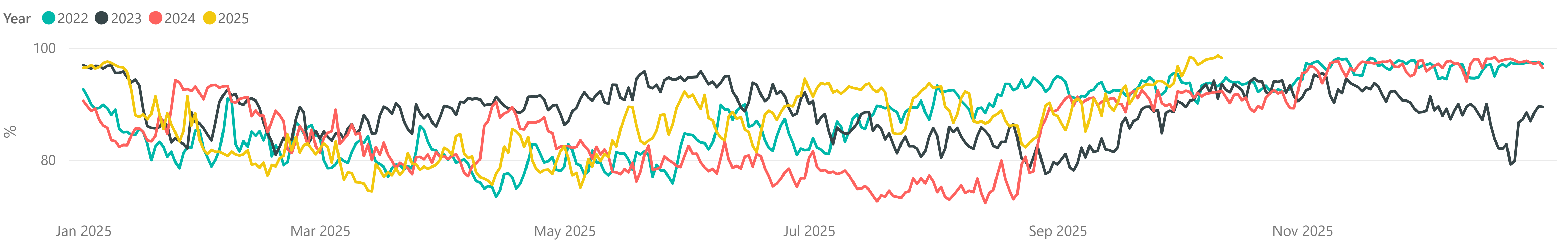
Weekly Generation Mix vs Capacity - GWh



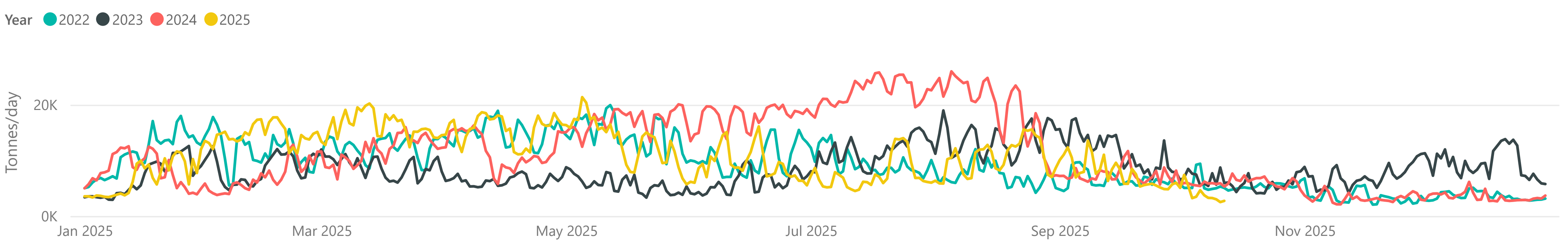
Weekly Generation Mix - GWh



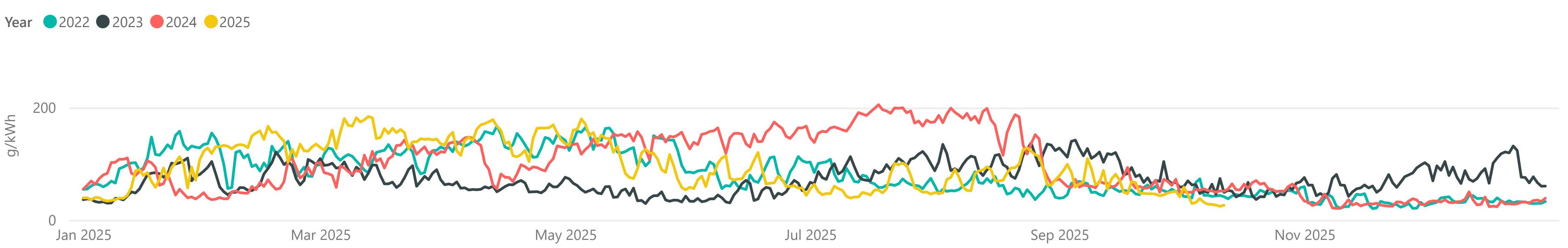
NZ Renewable Percentage



CO2 Tonnes/Day

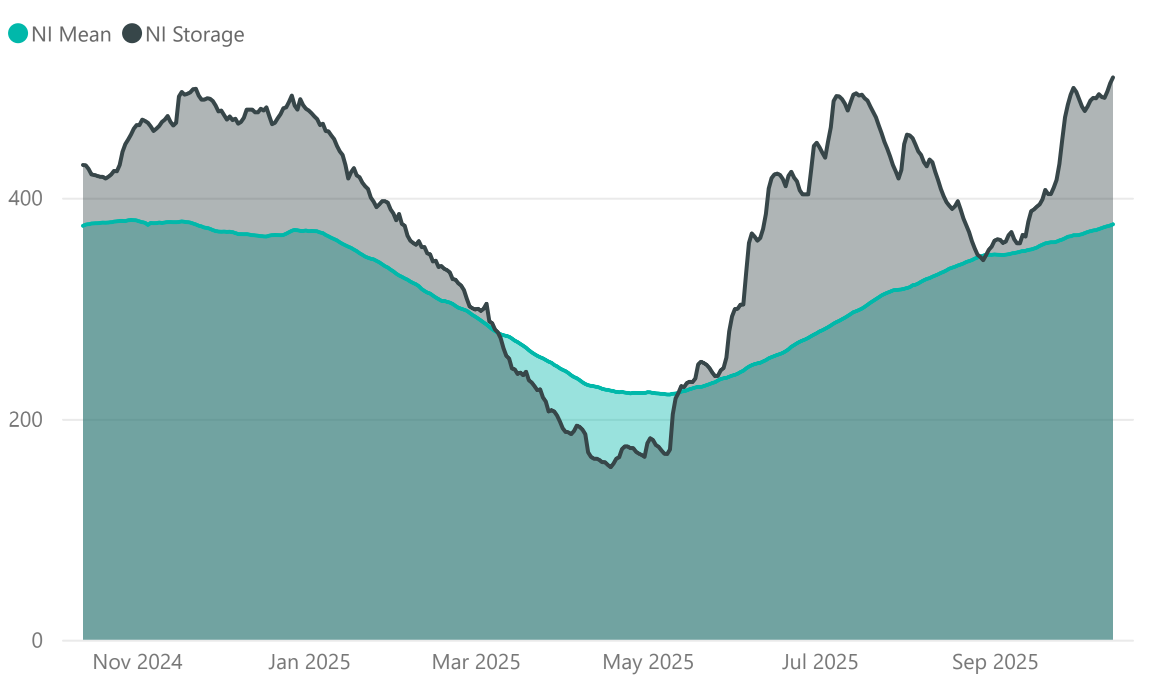


CO2 g/kWh



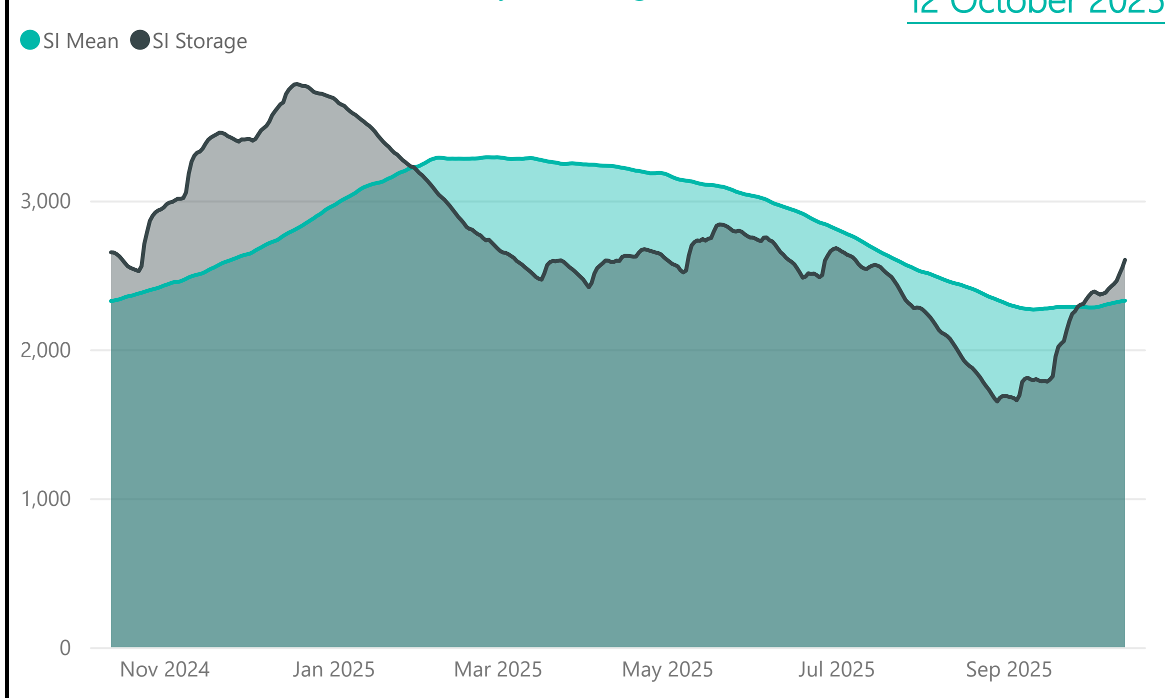
Hydro Storage

North Island Hydro Storage (Available GWh)

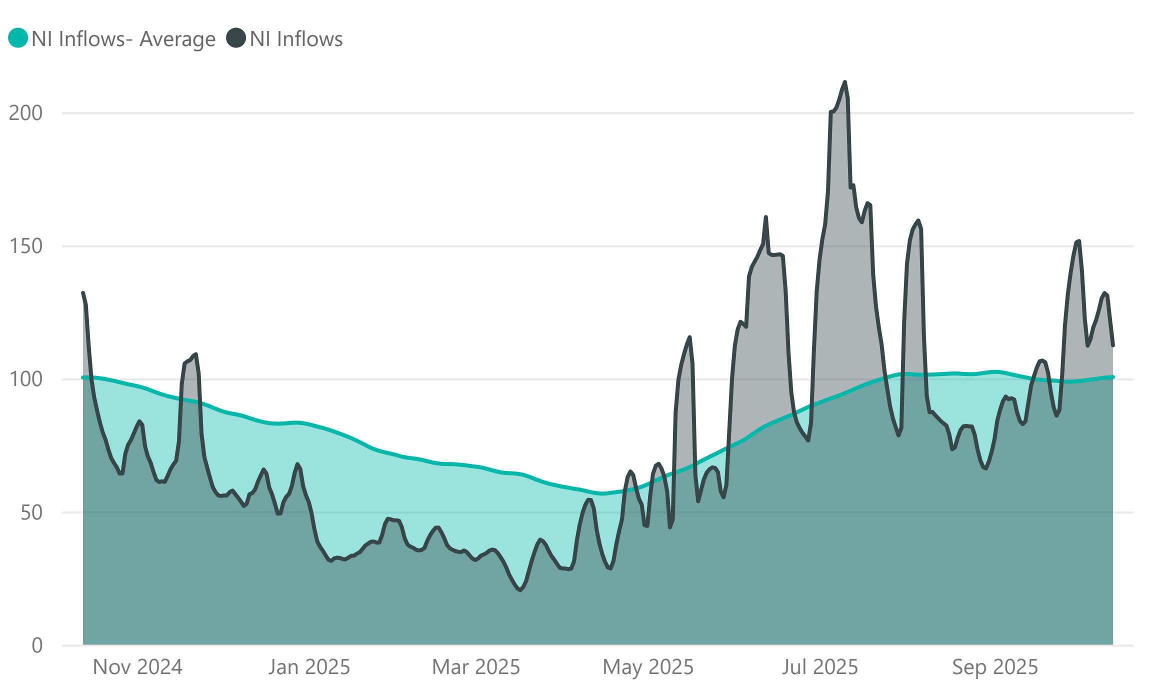


South Island Hydro Storage (Available GWh)

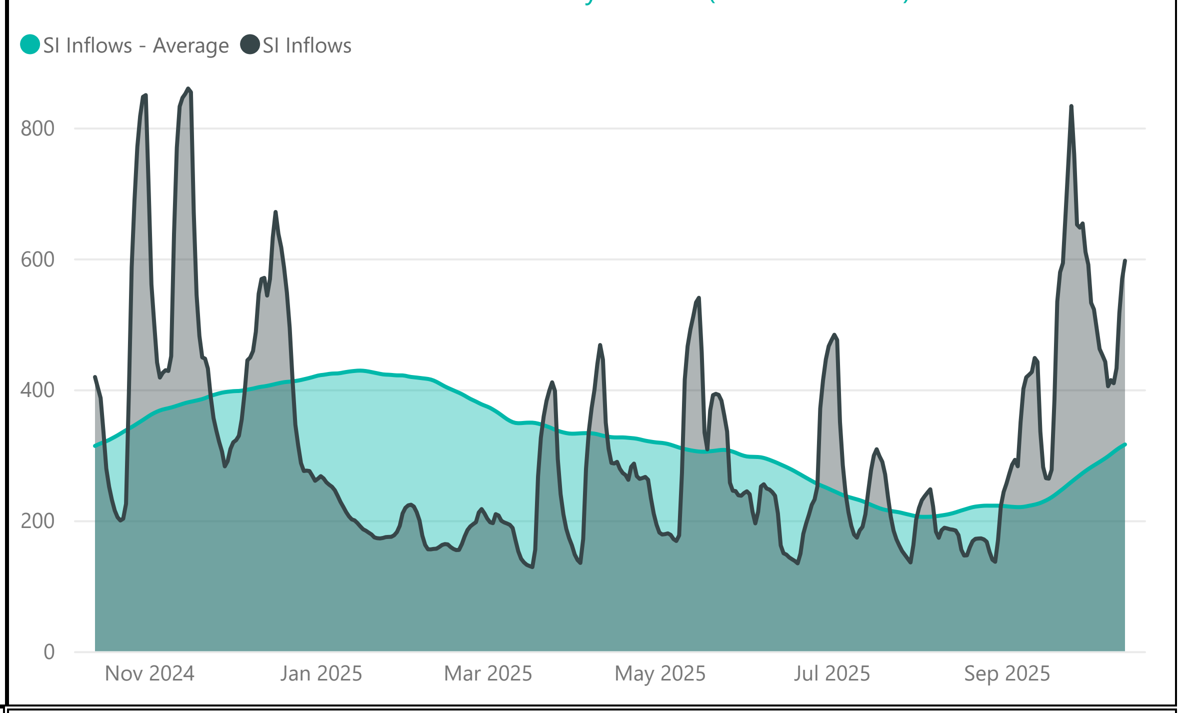
12 October 2025



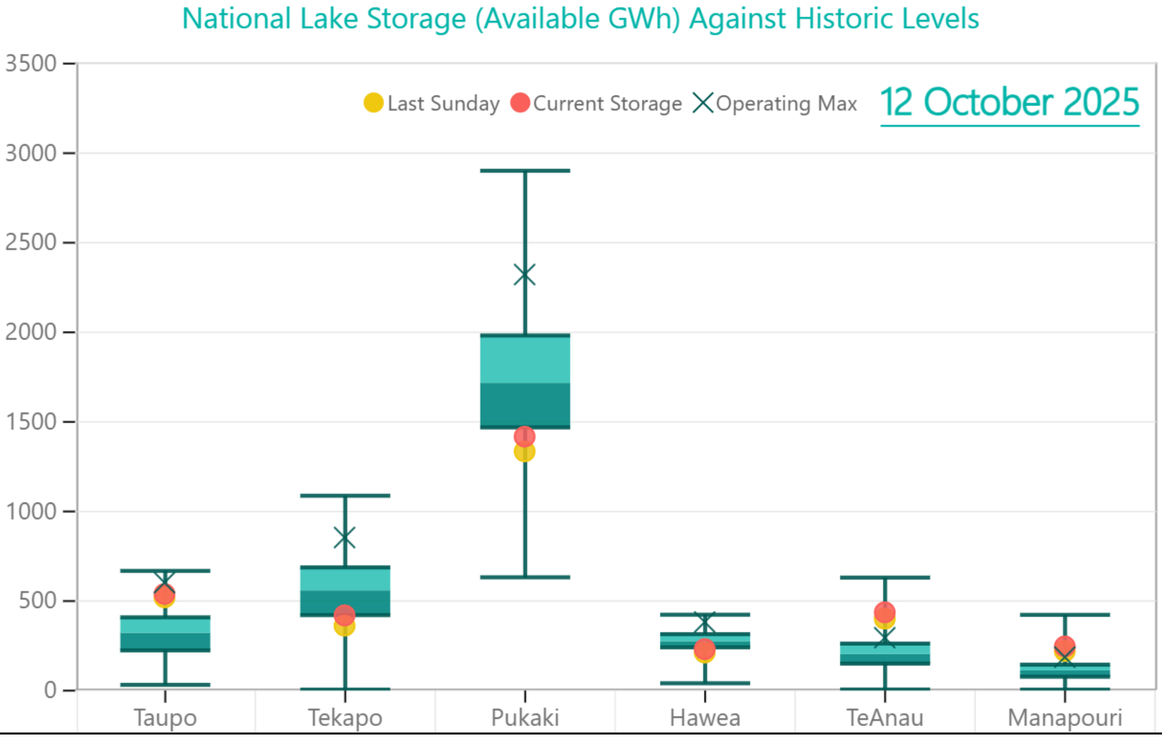
North Island Mean 7 Day Inflows (Available GWh)



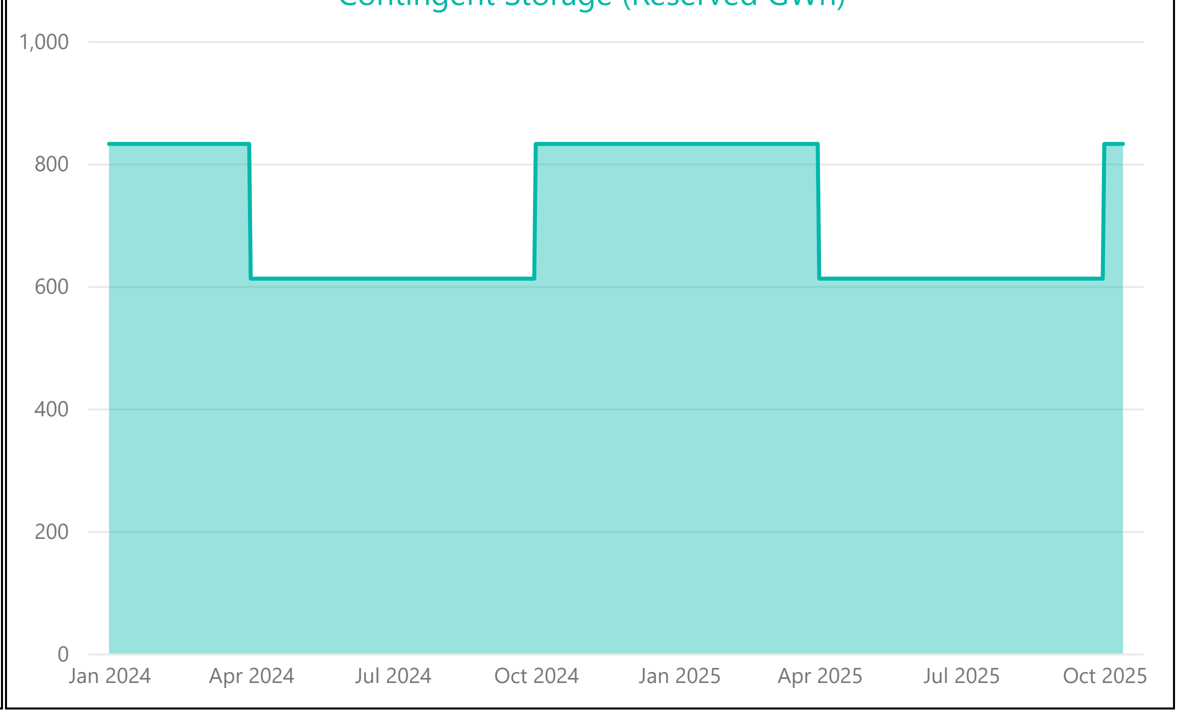
South Island Mean 7 Day Inflows (Available GWh)



National Lake Storage (Available GWh) Against Historic Levels



Contingent Storage (Reserved GWh)



For further information on security of supply and Transpower's responsibilities as the System Operator, refer to our webpage here: https://www.transpower.co.nz/system-operator/security-supply

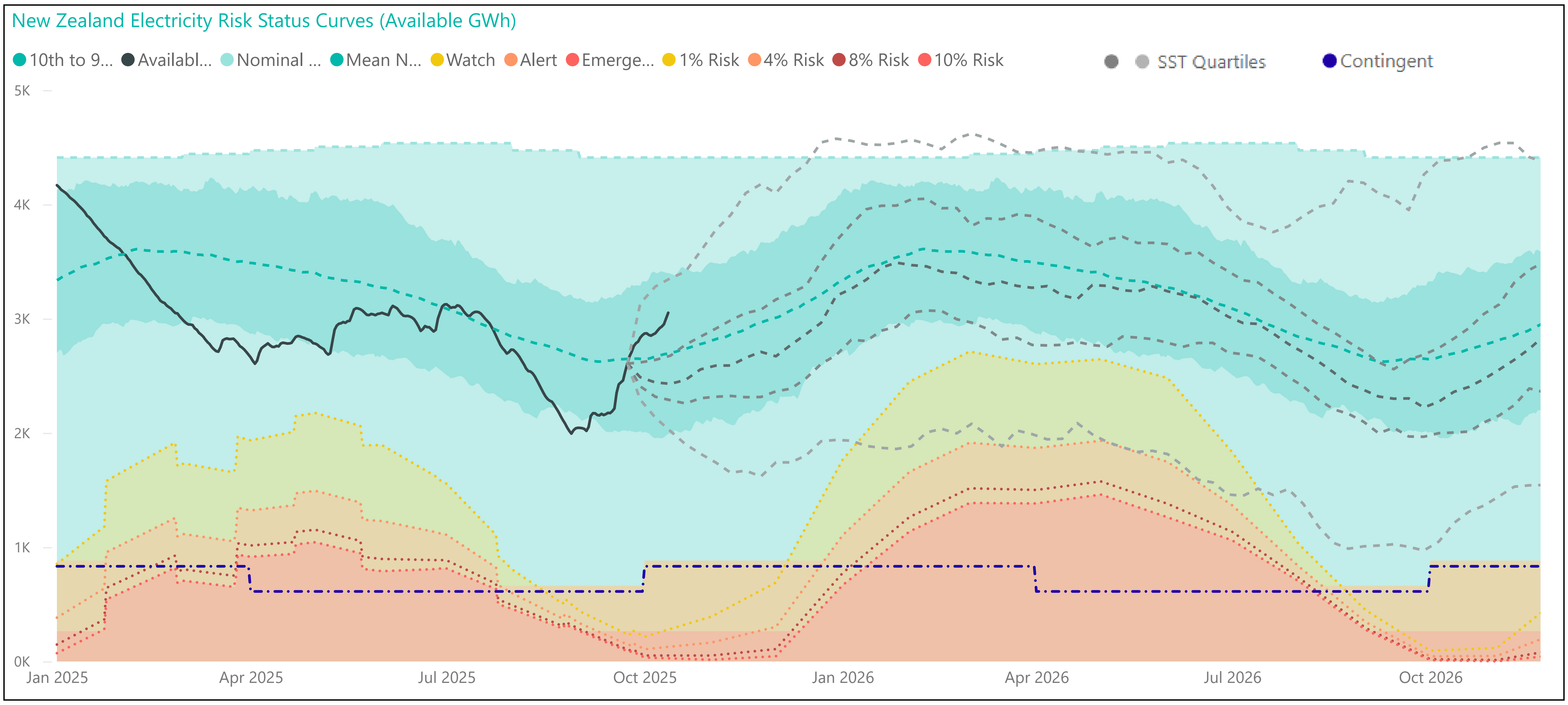
For any inquiries related to security of supply contact market.operations@transpower.co.nz

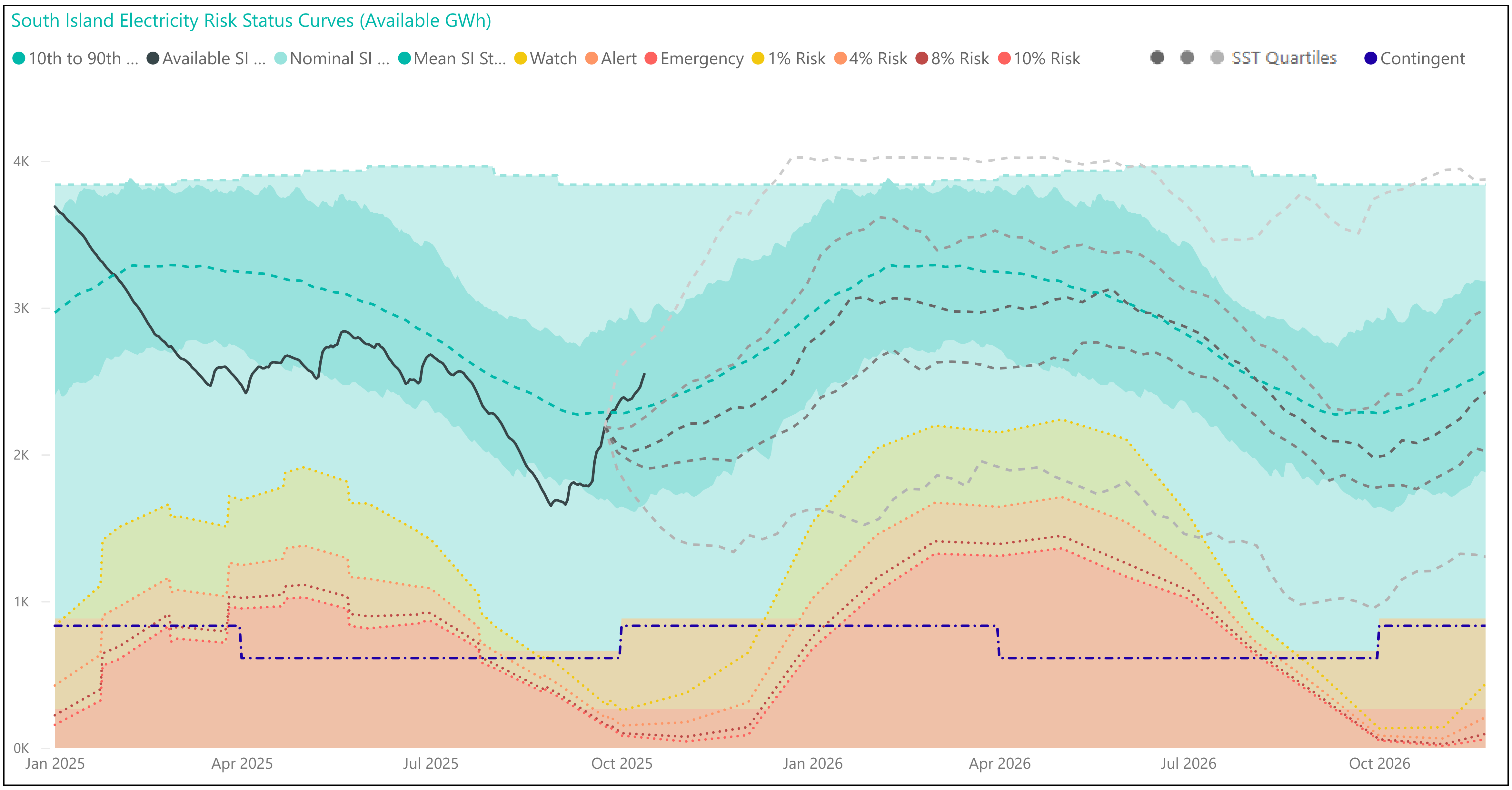
Hydro data used in this report is sourced from *NZX Hydro*.

Electricity risk curves have been developed for the purposes of reflecting the risk of extended energy shortages in a straightforward way, using a standardised set of assumptions.

Further information on the methodology of modelling electricity risk curves may be found here: https://www.transpower.co.nz/system-operator/security-supply/hydro-risk-curves-explanation

Electricity Risk Curves





Electricity Risk Curve Explanation:

Watch Curve - The maximum of the one percent risk curve and the floor and buffer
Alert Curve - The maximum of the four percent risk curve and the floor and buffer
Emergency Curve - The maximum of the 10 percent risk curve and the floor and buffer
Official Conservation Campaign Start - The Emergency Curve
Official Conservation Campaign Stop - The maximum of the eight percent risk curve and the floor and buffer

Note: The floor is equal to the amount of contingent hydro storage that is linked to the specific electricity risk curve, plus the amount of contingent hydro storage linked to electricity risk curves representing higher levels of risk of future shortage, if any. The buffer is 50 GWh.

The dashed grey lines represent the minimum, lower quartile, median, upper quartile and the maximum range of the simulated storage trajectories (SSTs). These will be updated with each Electricity Risk Curve update (monthly).