Market Operations Weekly Report - Week Ended 20 July 2025

Overview

New Zealand hydro storage remained close to historic average last week, sitting at 101% of the mean. South Island storage is still below the mean for this time of year. Demand last week was the highest it has been so far this year.

This week's insight looks at the average contribution to energy supply over time from different renewable generation types.

Security of Supply

Energy

New Zealand hydro storage decreased slightly last week but continues to sit close to historic average for the time of year at 101%. South Island hydro storage remained at 95% while North Island storage decreased from 166% to 153% last week.

Capacity

Capacity margins remained relatively healthy last week with the tightest peak being on the evening of Thursday 17 July when residual generation dropped to 446 MW coinciding with the highest demand peak. Residuals have dropped slightly compared to previous weeks due to colder temperatures.

The N-1-G margins in the NZGB forecast are healthy through to mid September, with moderate margins through to next weekend. 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 increased to 851 GWh last week from 829 GWh the week prior; this was the highest weekly demand so far this year due to colder temperatures. Although demand was high last week, it remains in line with demand in the last three years at this time of year. The highest demand peak was 6,718 MW, which occurred at 6:00pm on Thursday 17 July.

Weekly Prices

The average wholesale electricity spot price at Ōtāhuhu last week increased to $95/MWh from $67/MWh the week prior. Wholesale prices peaked at $296/MWh at Ōtāhuhu at 7:30am on Tuesday 15 July.

Generation Mix

Hydro generation increased to 64% of the mix from 63% the week prior; this is significantly higher than its average contribution across the year of 54%. Thermal generation remained at 6% of the mix, which is around half of its average level across the year. Wind generation decreased from 7% to 6% of the mix and geothermal increased from 21% to 22%.

HVDC

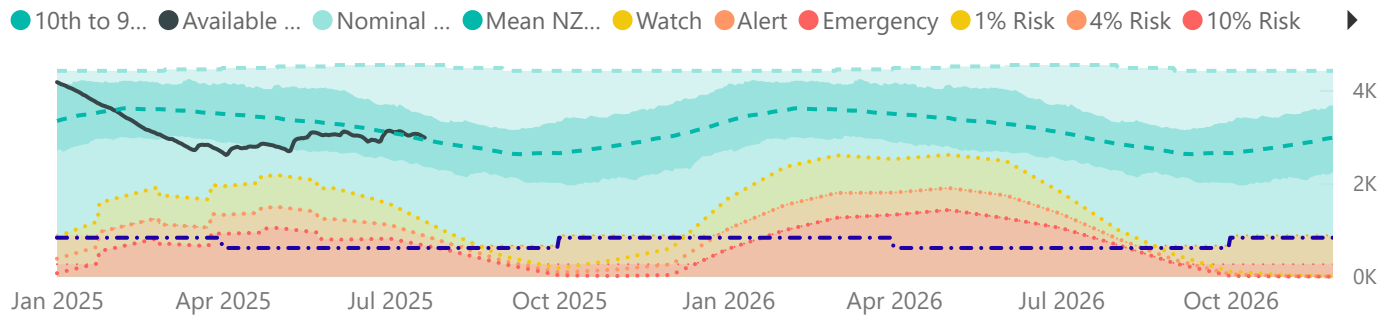
HVDC flow last week was predominantly northward with overnight periods of southward flow coinciding with periods of lower demand. In total, 49 GWh was sent north and 10 GWh was sent south.

New Zealand Energy Risk

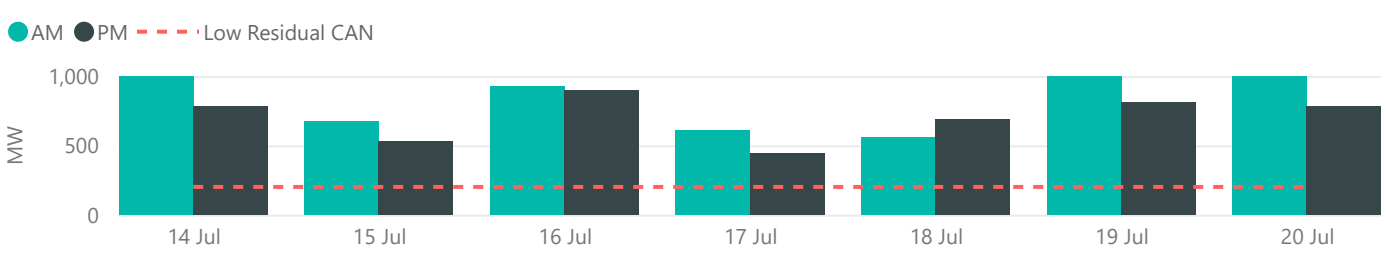
South Island Energy Risk

Normal Watch Alert Emergency

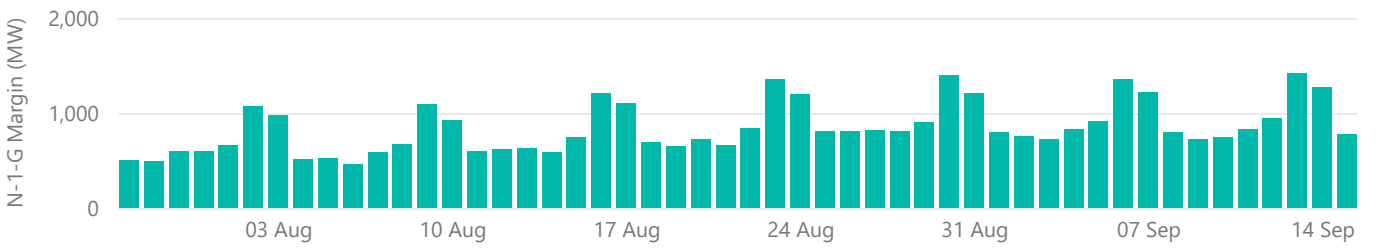
New Zealand Electricity Risk Status Curves (Available GWh)



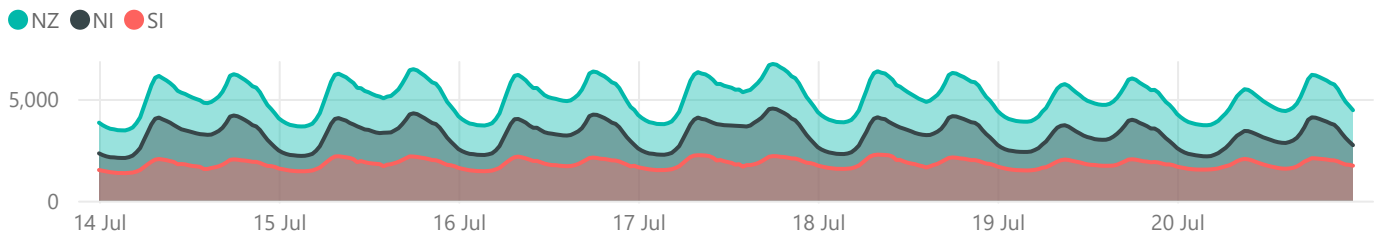
Lowest Residual Points - MW



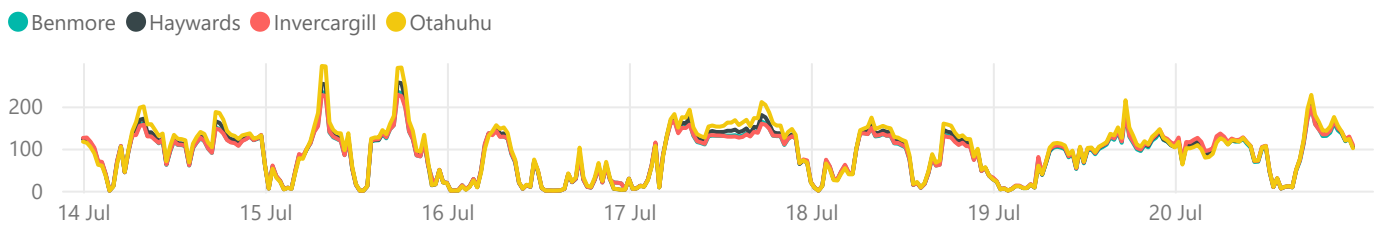
NZGB Look-Ahead (excluding next 7 days)



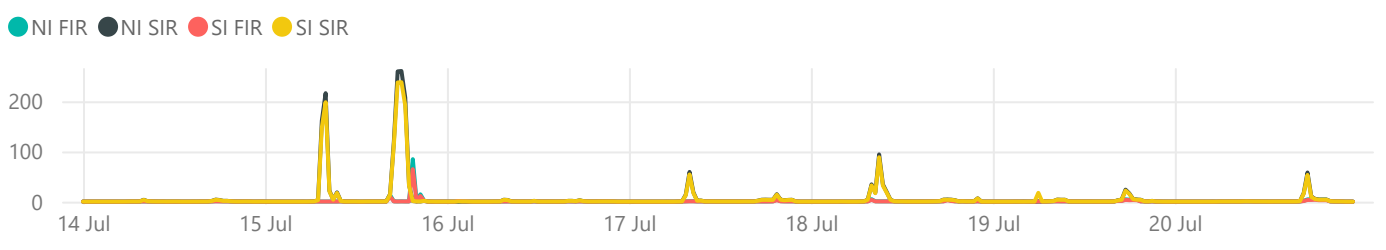
National Demand by Trading period - MW



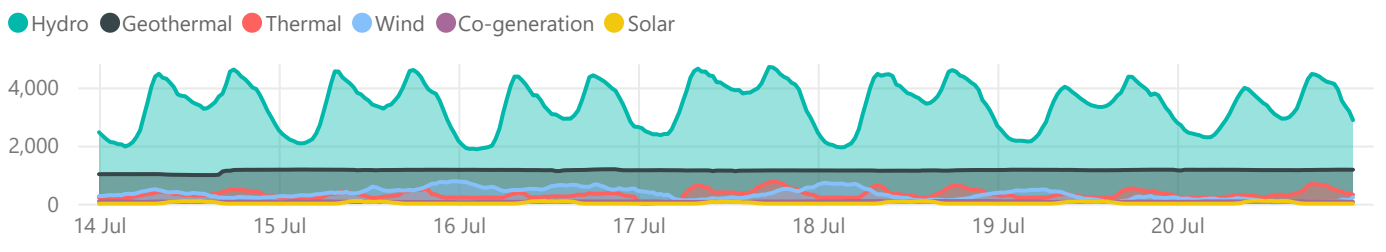
Energy Prices - $/MWH



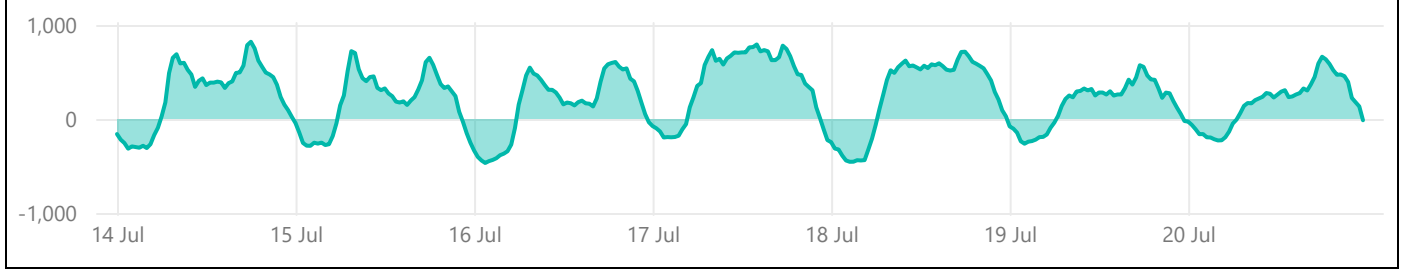
Reserve Prices - $/MW



Generation - MW



Net HVDC Transfer - MW (Northward positive)



Weekly Insight - Energy Supply from Different Renewables

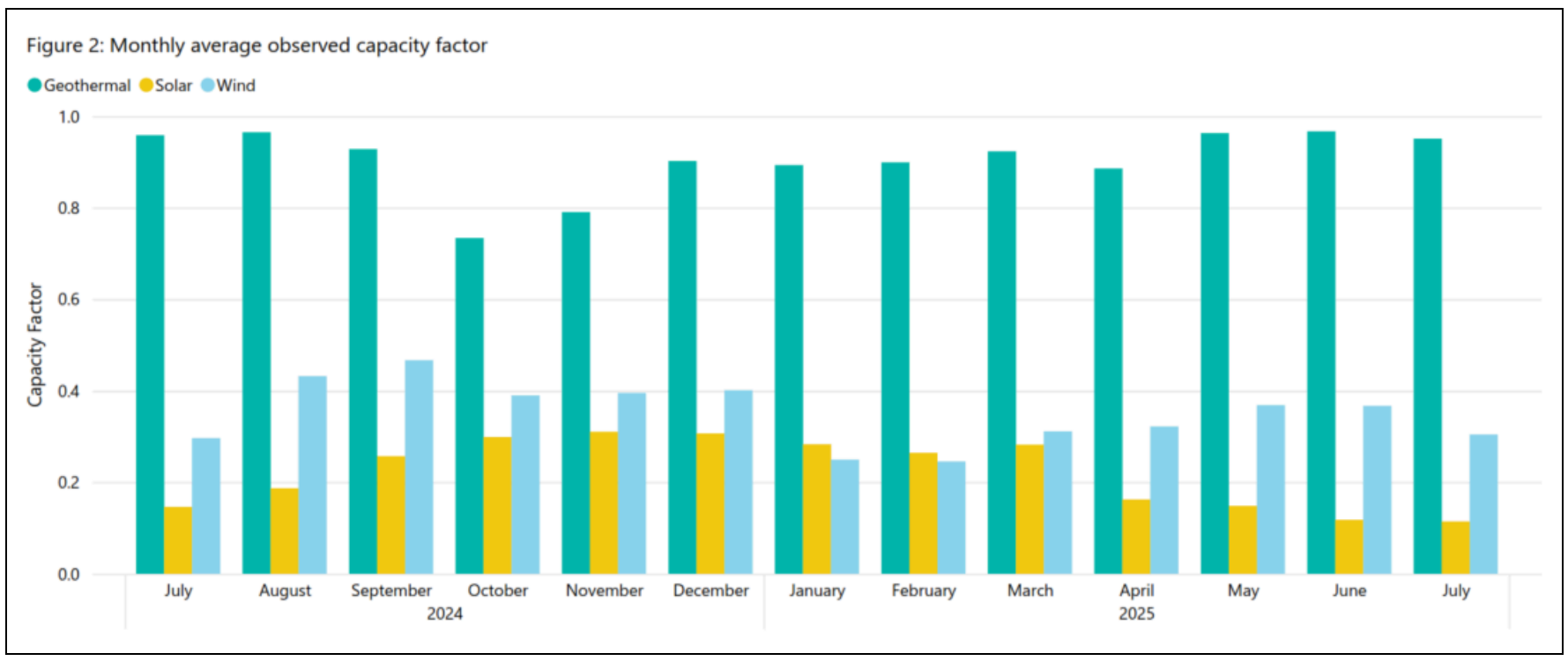
New Zealand's renewable generation pipeline continues to grow, and each generation type contributes to electricity supply in different ways. This insight looks at a year's worth of half-hourly generation data for wind, solar, and geothermal plants, highlighting the difference between installed capacity and actual generation output. These three generation types dominate the future generation pipeline and are comparable due to their typically low short-run marginal cost - once built, they continuously run when the required resources are available. This is unlike thermal and hydro generators, which can flex output up or down based on market conditions.

Figure 1 shows the monthly average of half-hourly generation data for each technology type compared to its installed capacity. The average generation from wind and solar in each trading period is significantly lower than their installed capacities. This highlights the intermittent nature of these technologies, which can drop off quickly and produce little to no generation output due to weather and daylight conditions. Geothermal generation remains consistent in each trading period, with its output only affected by plant outages (as seen by the drop in geothermal generation in October and November 2024, mainly due to planned maintenance outages).

Figure 1: Monthly average of half hourly generation and installed MW capacity

Figure 2 shows the monthly average of observed capacity factors, calculated as actual half-hour generation divided by the maximum possible output for each generation type. Consistent operation of geothermal plants near full capacity results in significantly higher average capacity factors than wind and solar generators. This highlights that 1 MW of new installed capacity does not contribute equally across technology types when considering how they contribute to energy supply across the year.

Figure 2: Monthly average observed capacity factor



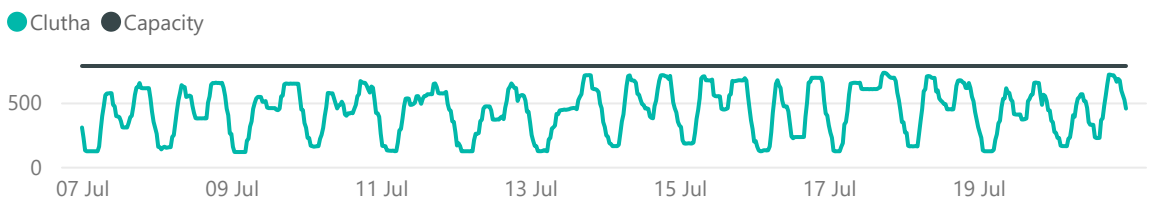
A diverse generation mix enhances system reliability by compensating for seasonal fluctuations in generation output. For example, wind, geothermal, and hydro generation can support lower solar generation in winter, while solar can complement reduced wind output in calmer summer months. In dry years, solar, wind, and geothermal can help offset reduced hydro generation.

The increased investment in diverse generation sources (including wind and solar) plays a key role in decarbonising the electricity system and increasing overall energy supply reliability. However, intermittent generators have limitations when it comes to contributing firm capacity on average. This means they need to be complemented by energy storage, demand response, or firm flexible generation like geothermal, hydro, and or thermal to increase reliability.

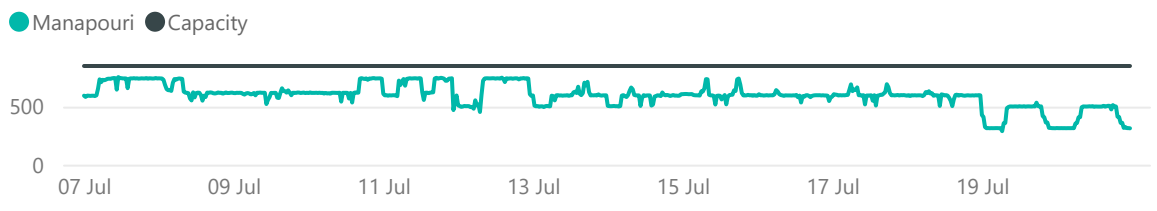
Generation Breakdown - Last Two Weeks

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

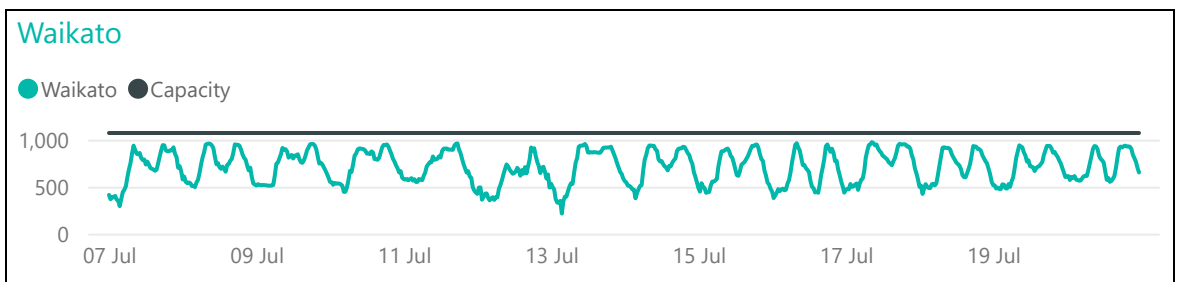
Clutha



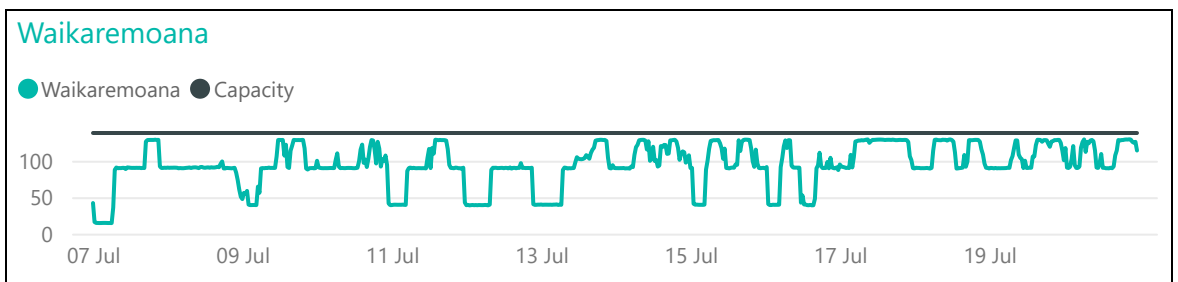
Manapouri



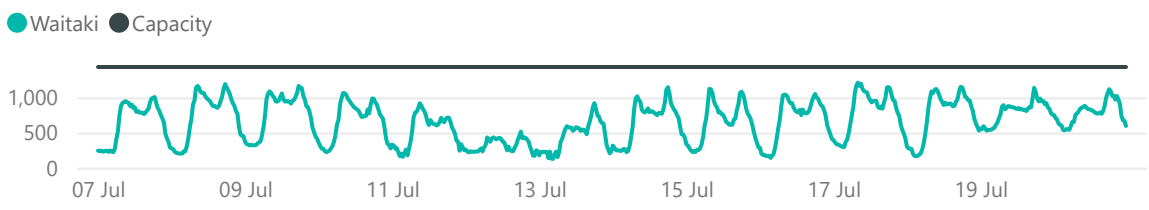
Waikato



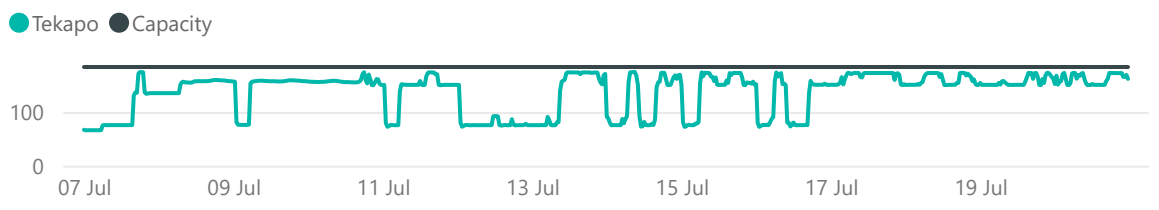
Waikaremoana



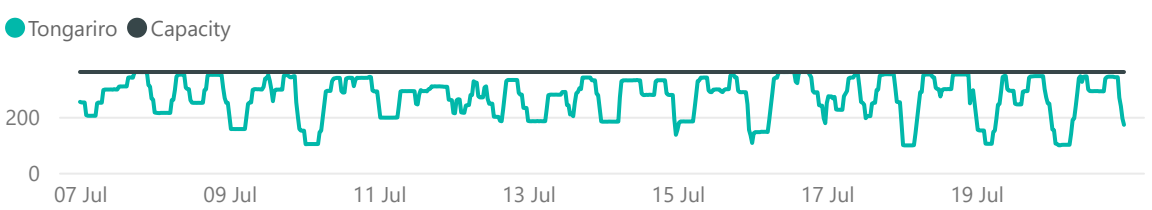
Waitaki



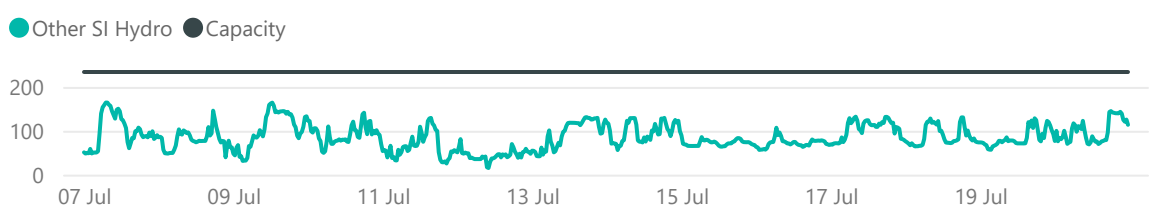
Tekapo



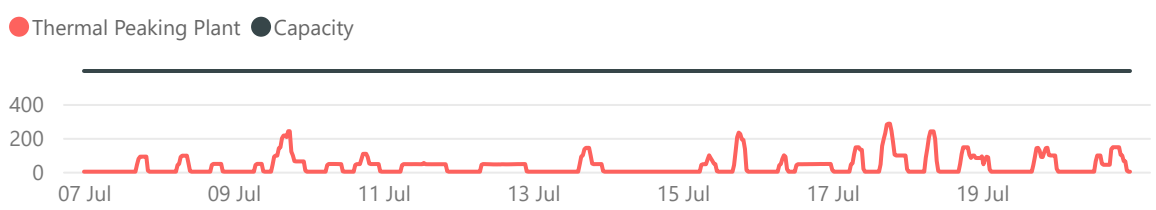
Tongariro



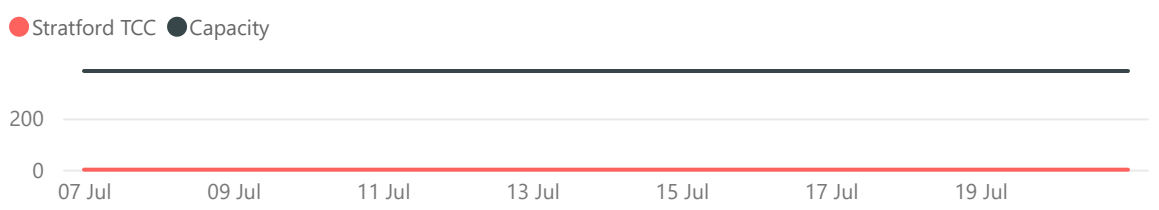
Other SI Hydro



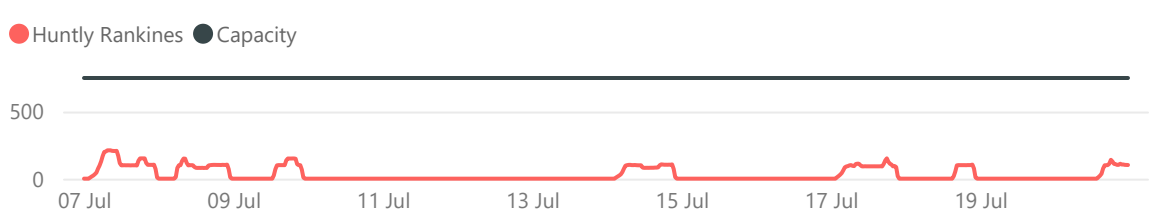
Thermal Peaking Plant



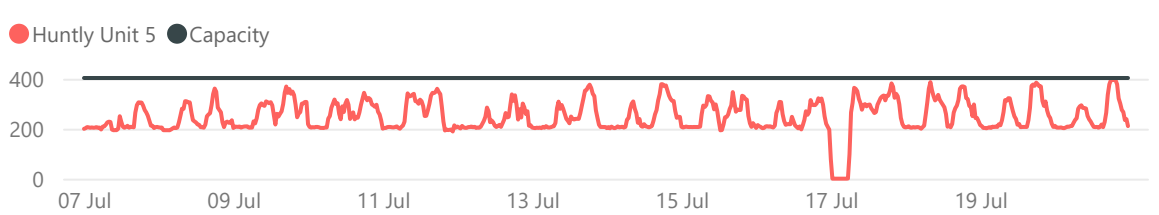
Stratford TCC



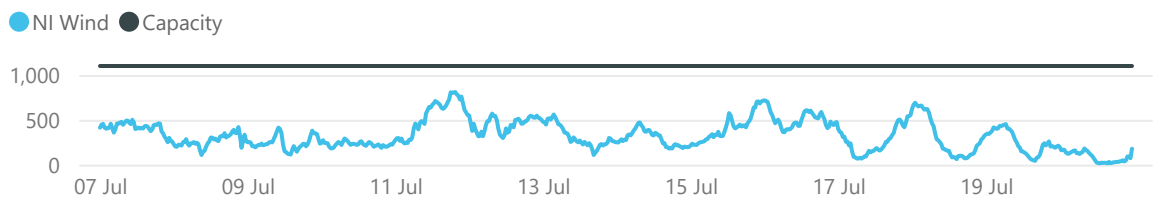
Huntly Rankines



Huntly U5

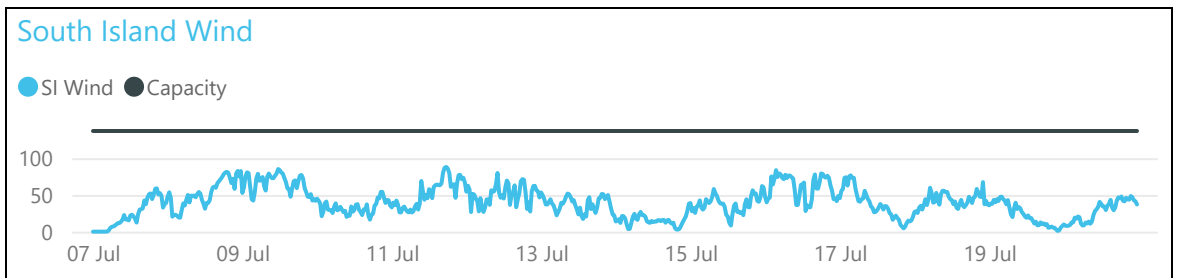


North Island Wind

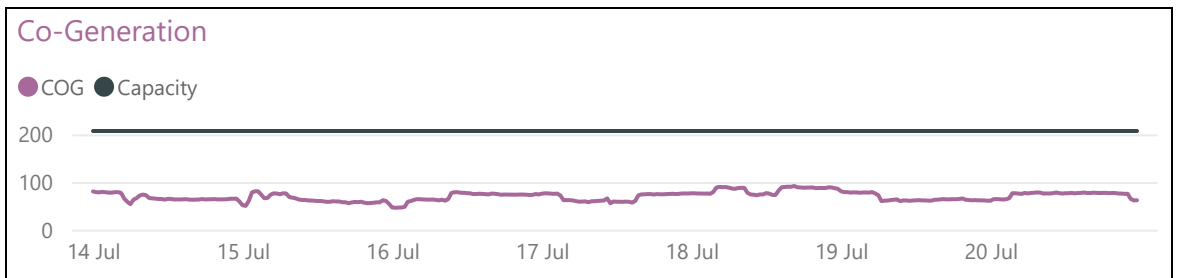


Geothermal

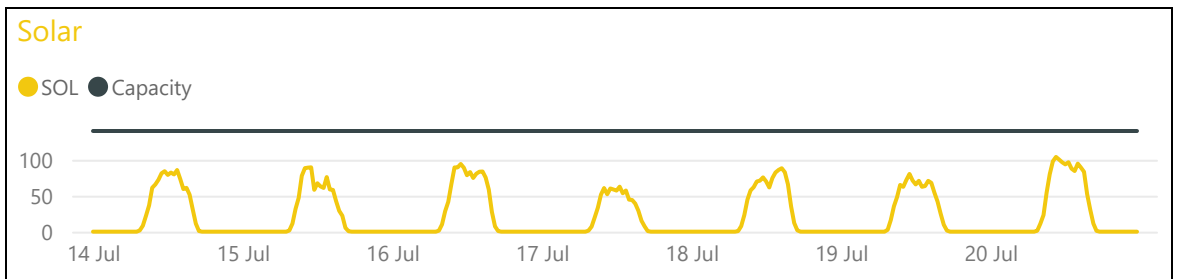
South Island Wind



Co-Generation

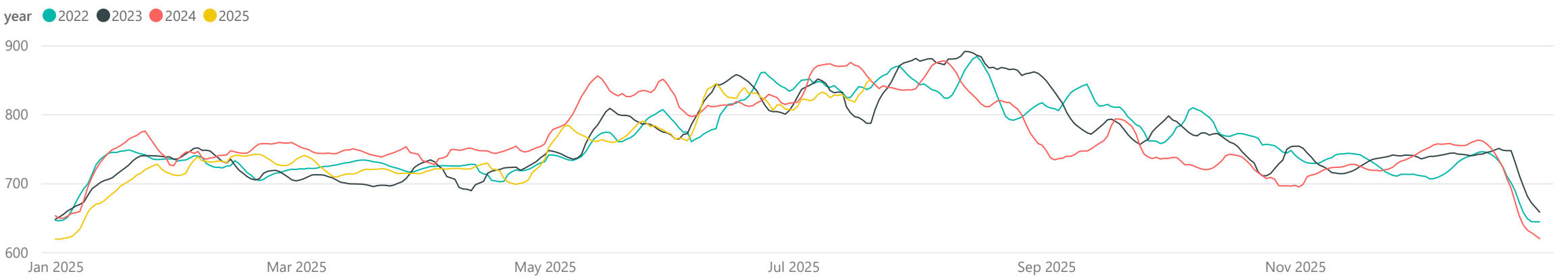


Solar

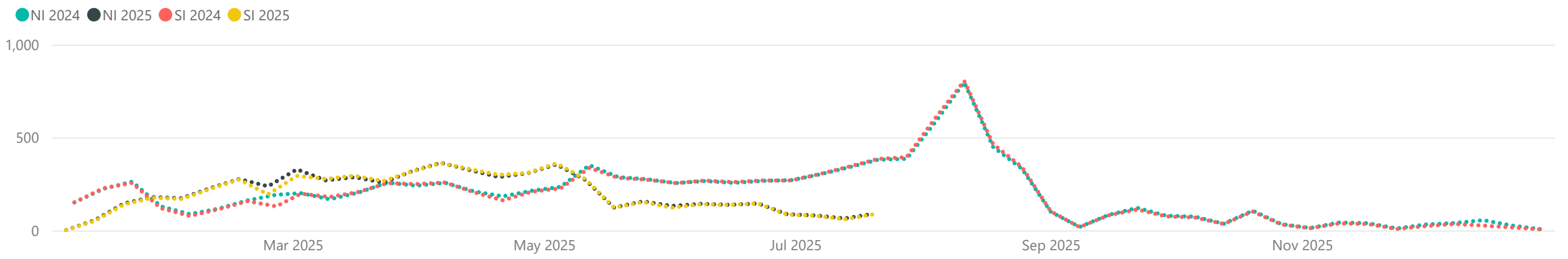


Weekly Profiles

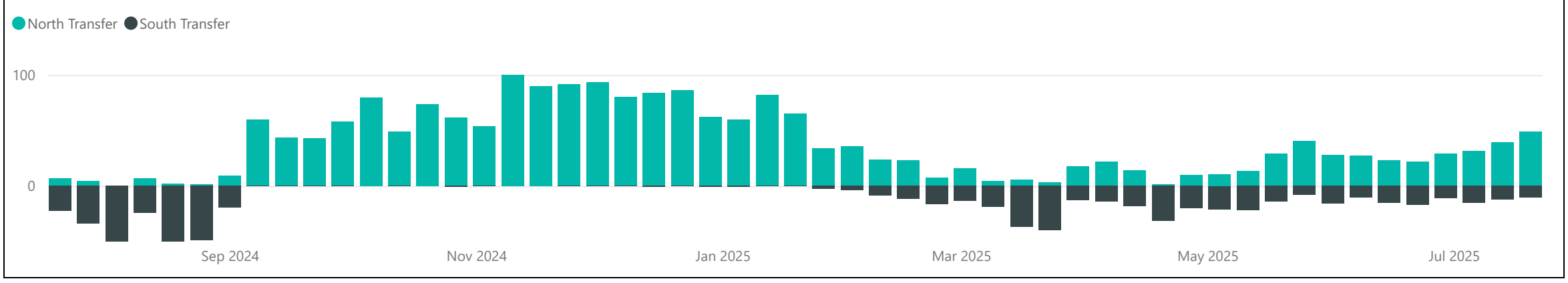
National Weekly Demand - GWh - 7 Day Rolling



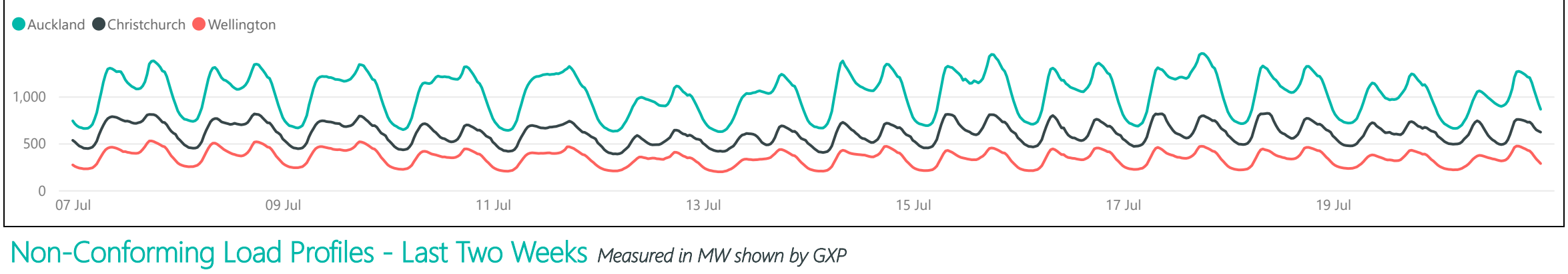
Weekly Spot Price - $/MWh



HVDC Transfer - Weekly GWh



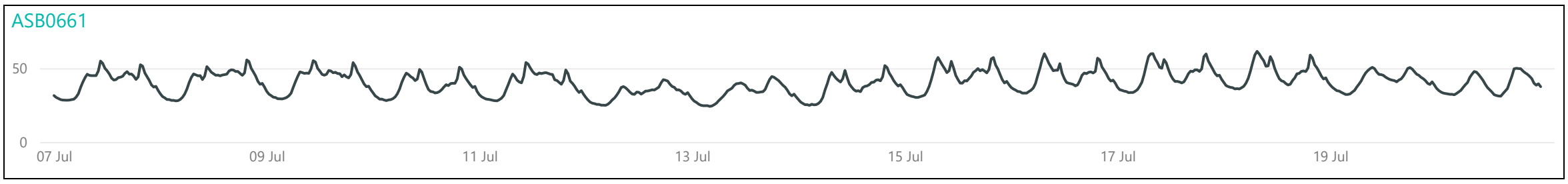
Conforming Load Profiles - Last Two Weeks *Measured in MW shown by region*



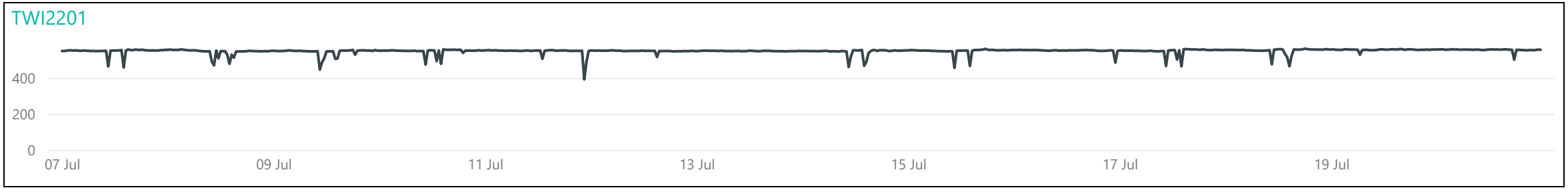
Non-Conforming Load Profiles - Last Two Weeks *Measured in MW shown by GXP*

GLN0331

ASB0661



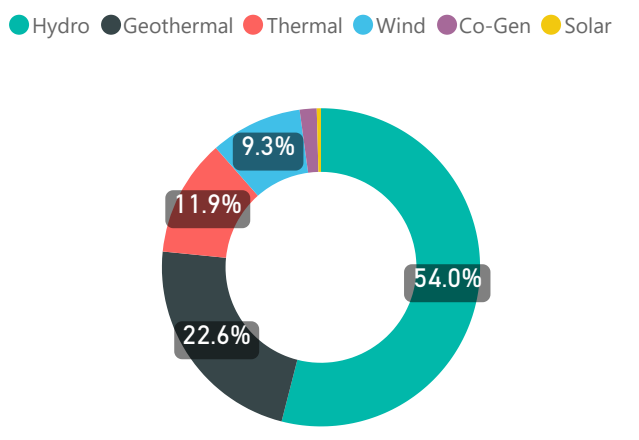
TWI2201



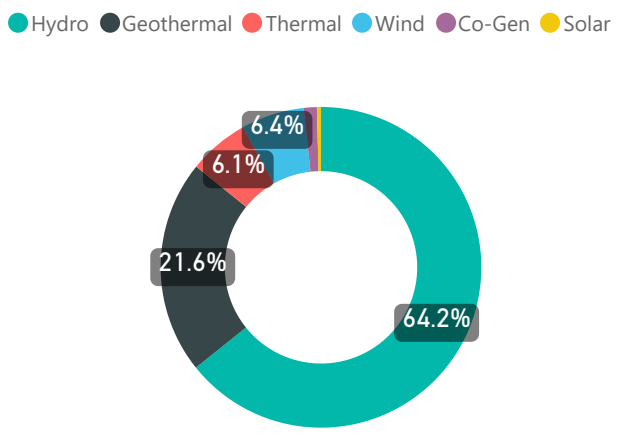
TRANSPOWER

Generation Mix

Last 52 Weeks Generation Mix - Weekly GWh



Last 7 Days Generation Mix - Weekly GWh



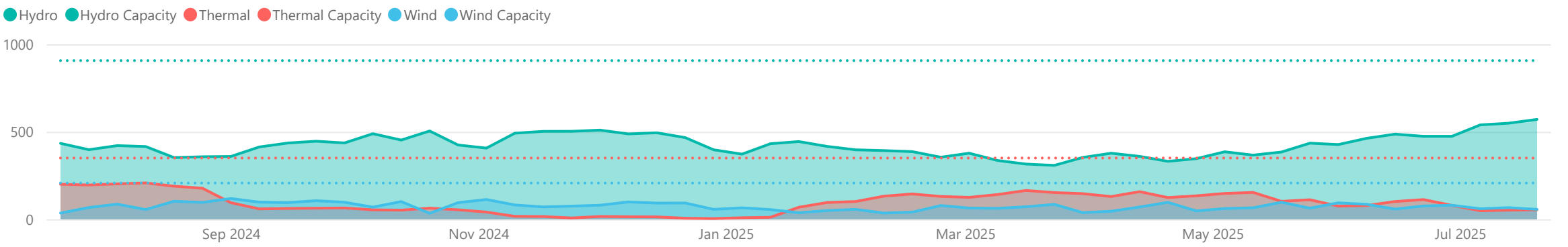
Average Metrics Last 7 Days

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
93%	44,992	50.1

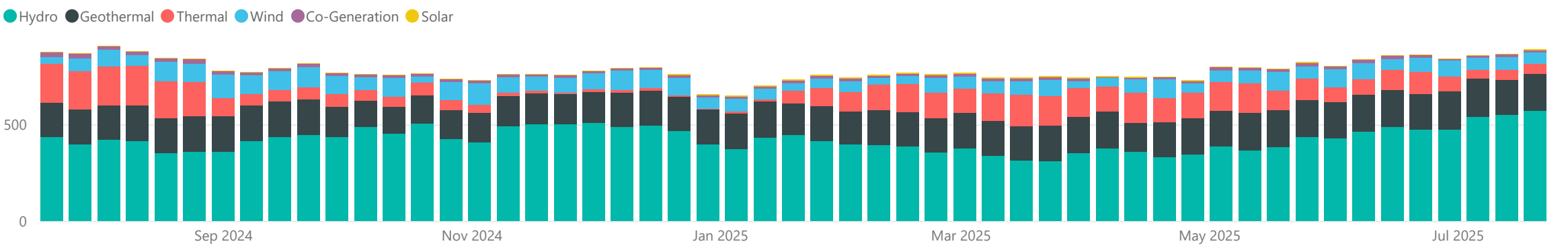
Average Metrics Last 52 Weeks

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
87%	74,833	94.4

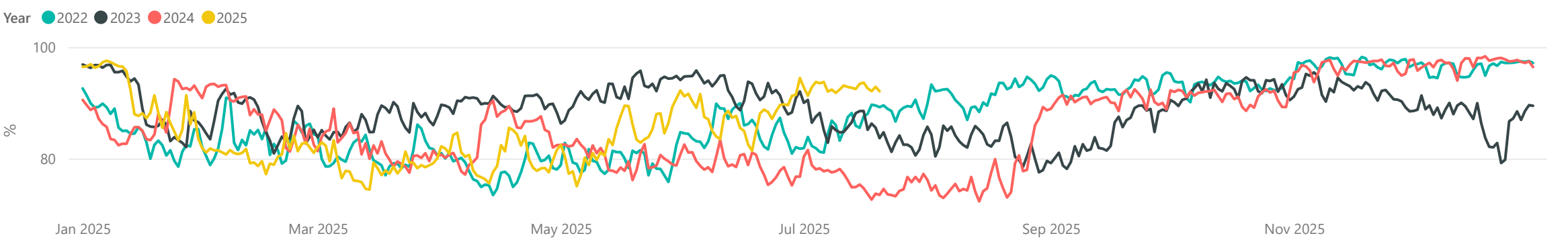
Weekly Generation Mix vs Capacity - GWh



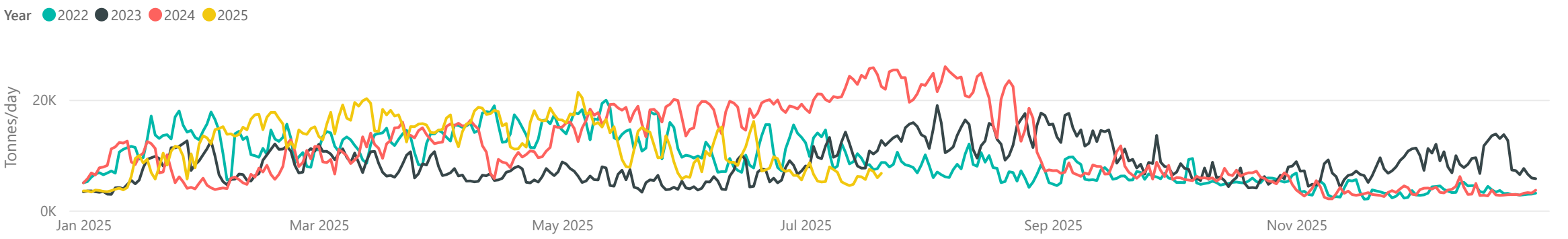
Weekly Generation Mix - GWh



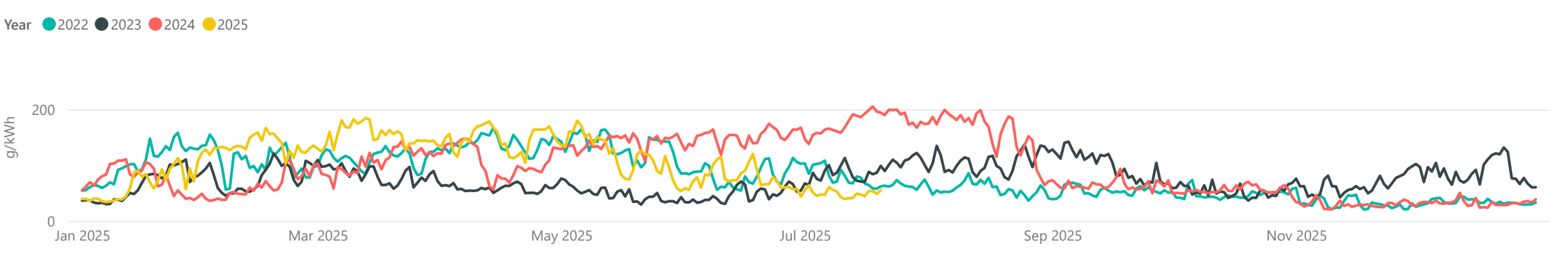
NZ Renewable Percentage



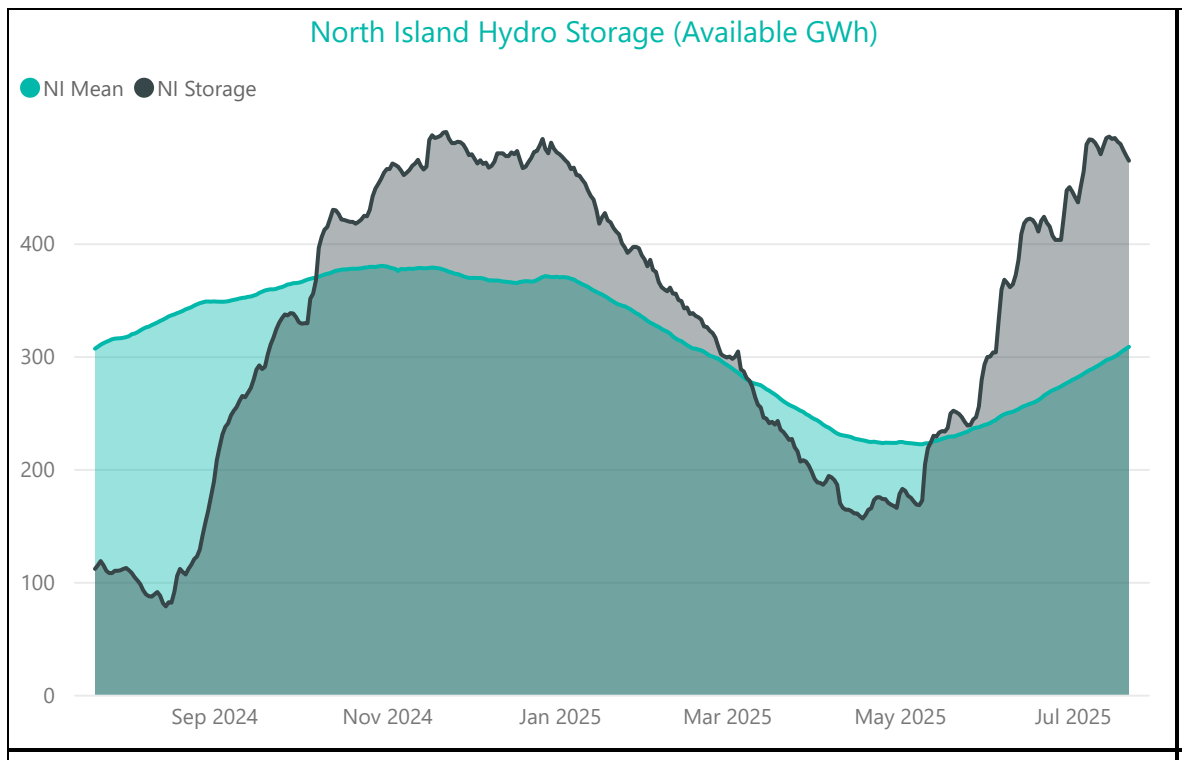
CO2 Tonnes/Day

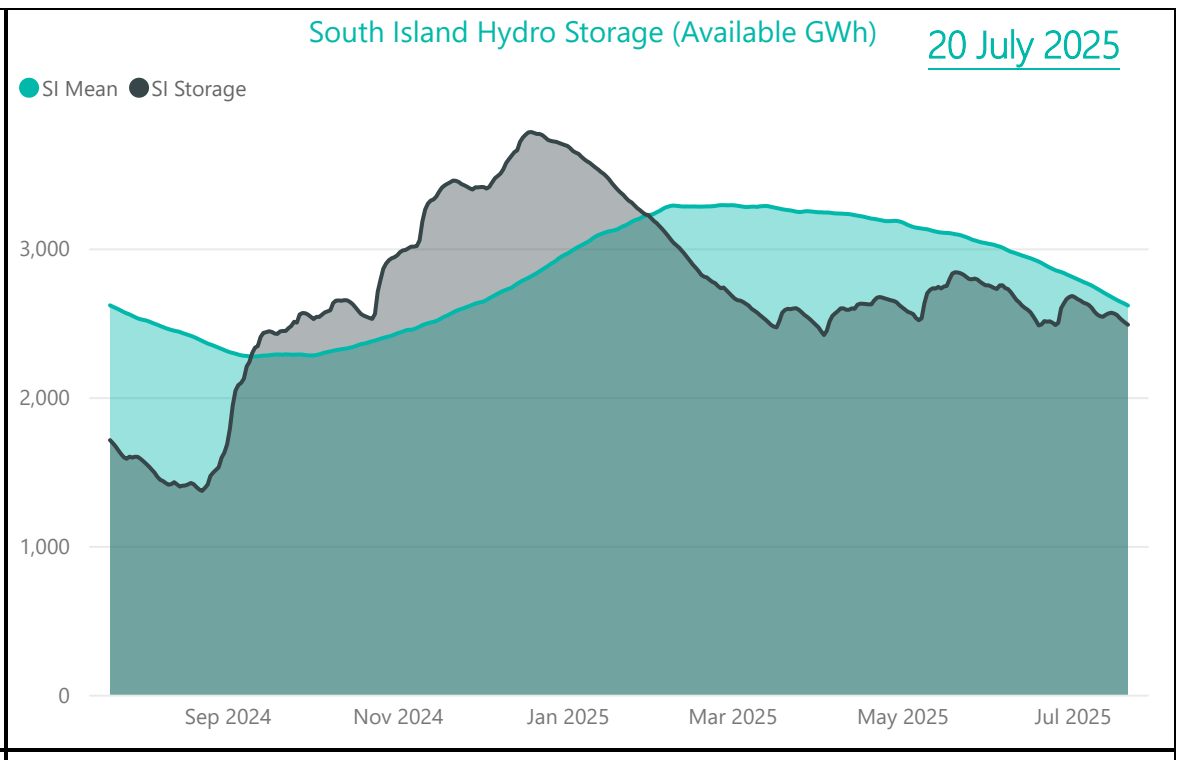


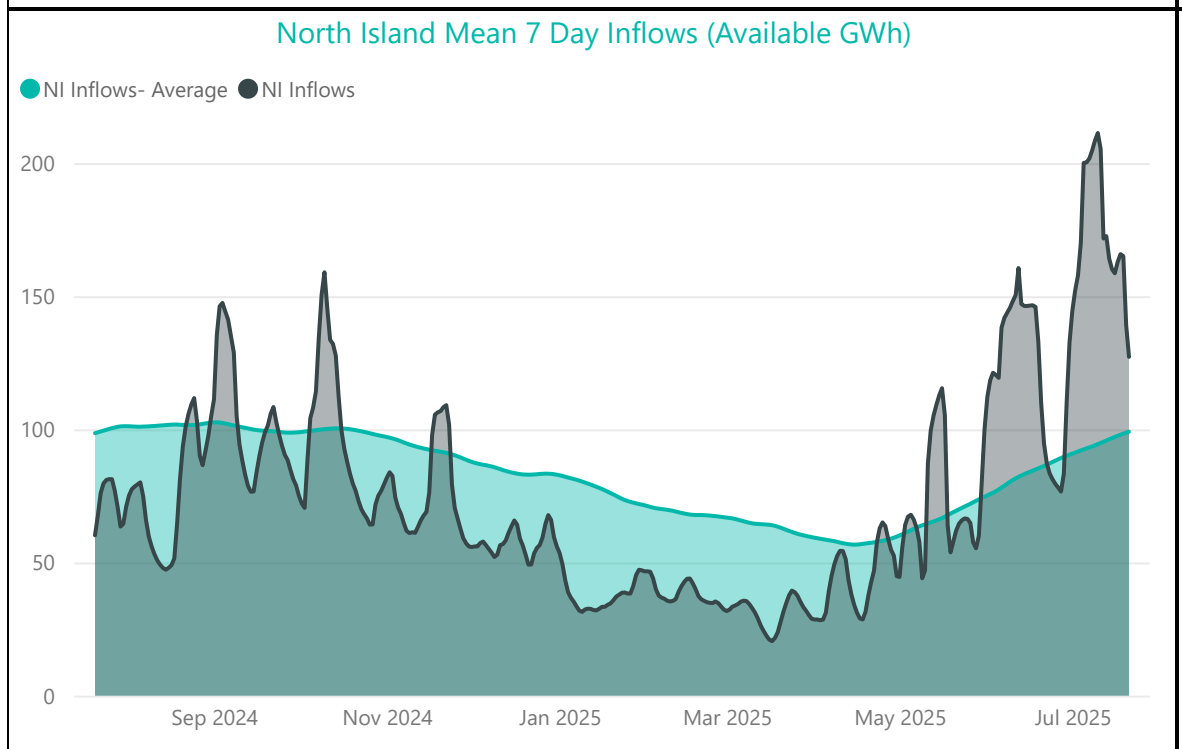
CO2 g/kWh

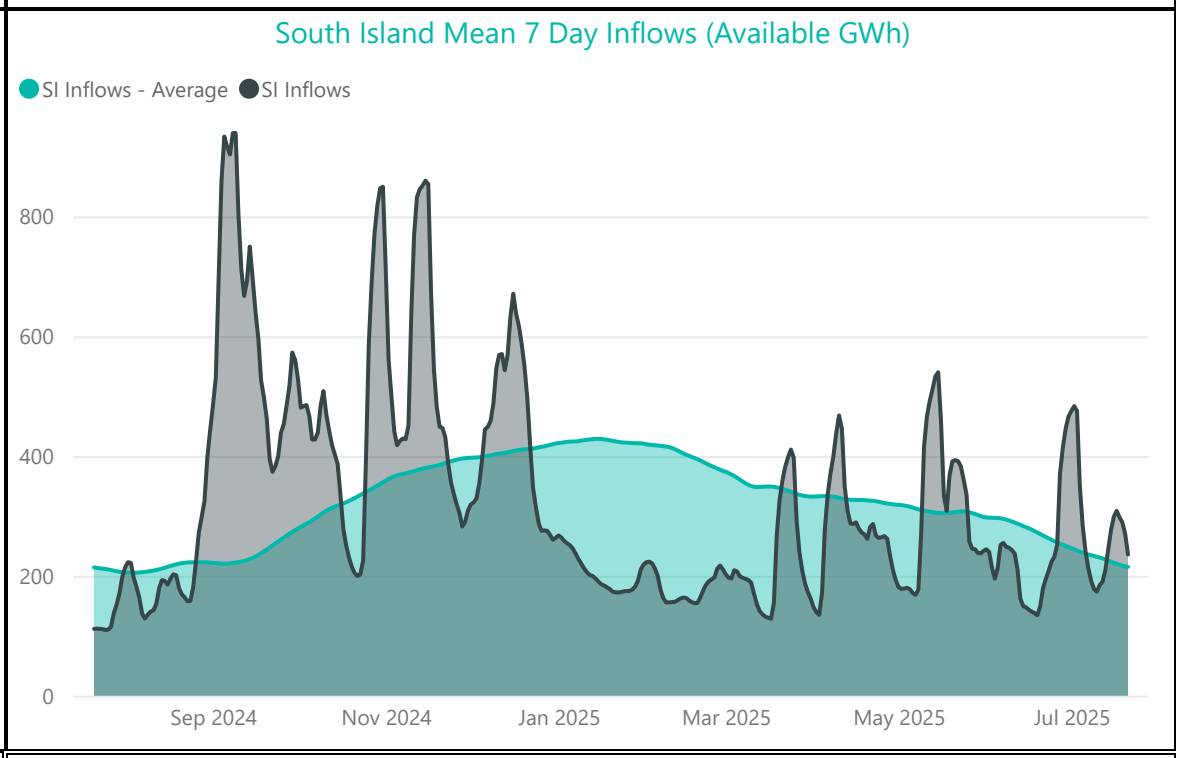


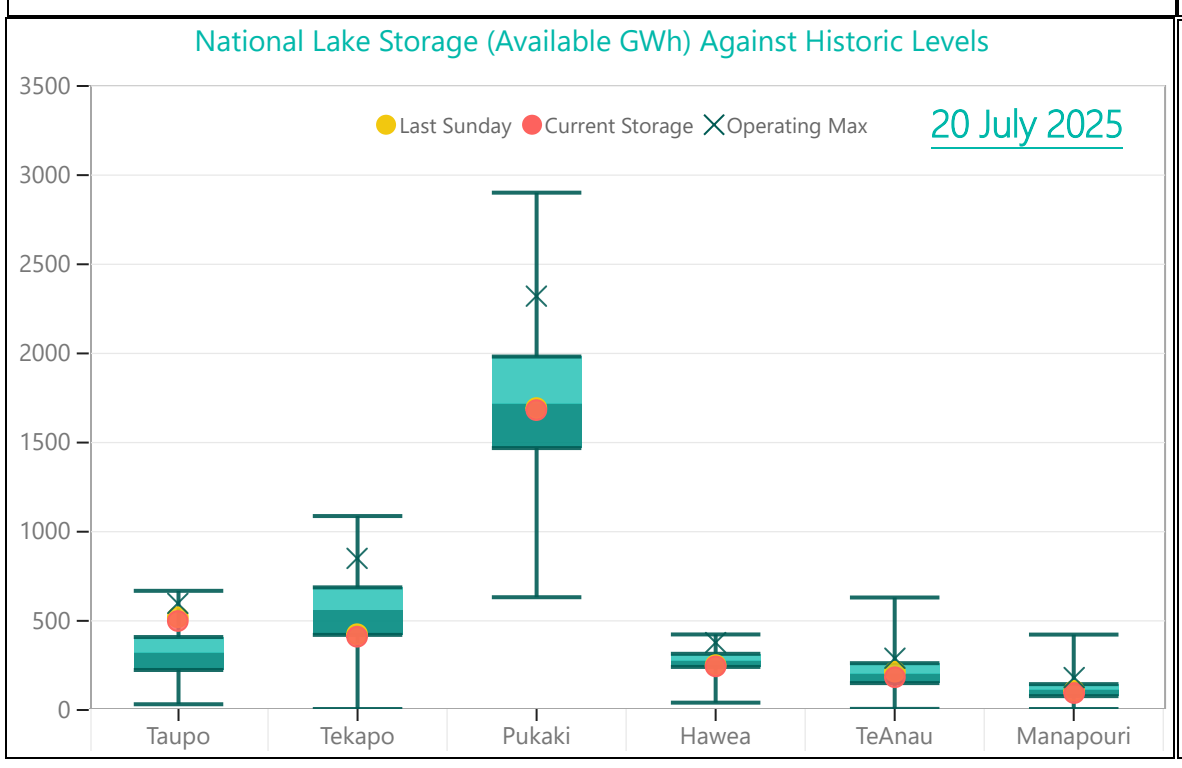
Hydro Storage

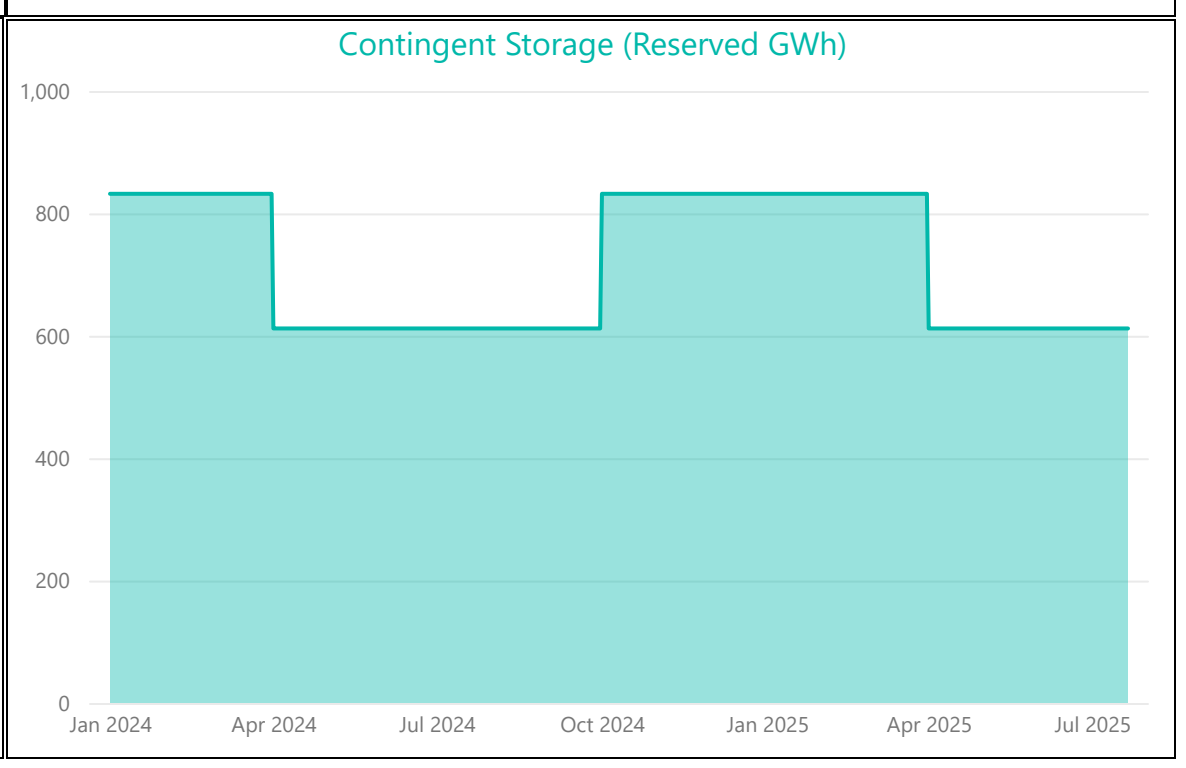












For further information on security of supply and Transpower's responsibilities as the System Operator, refer to our webpage here: https://www.transpower.co.nz/system-operator/security-supply

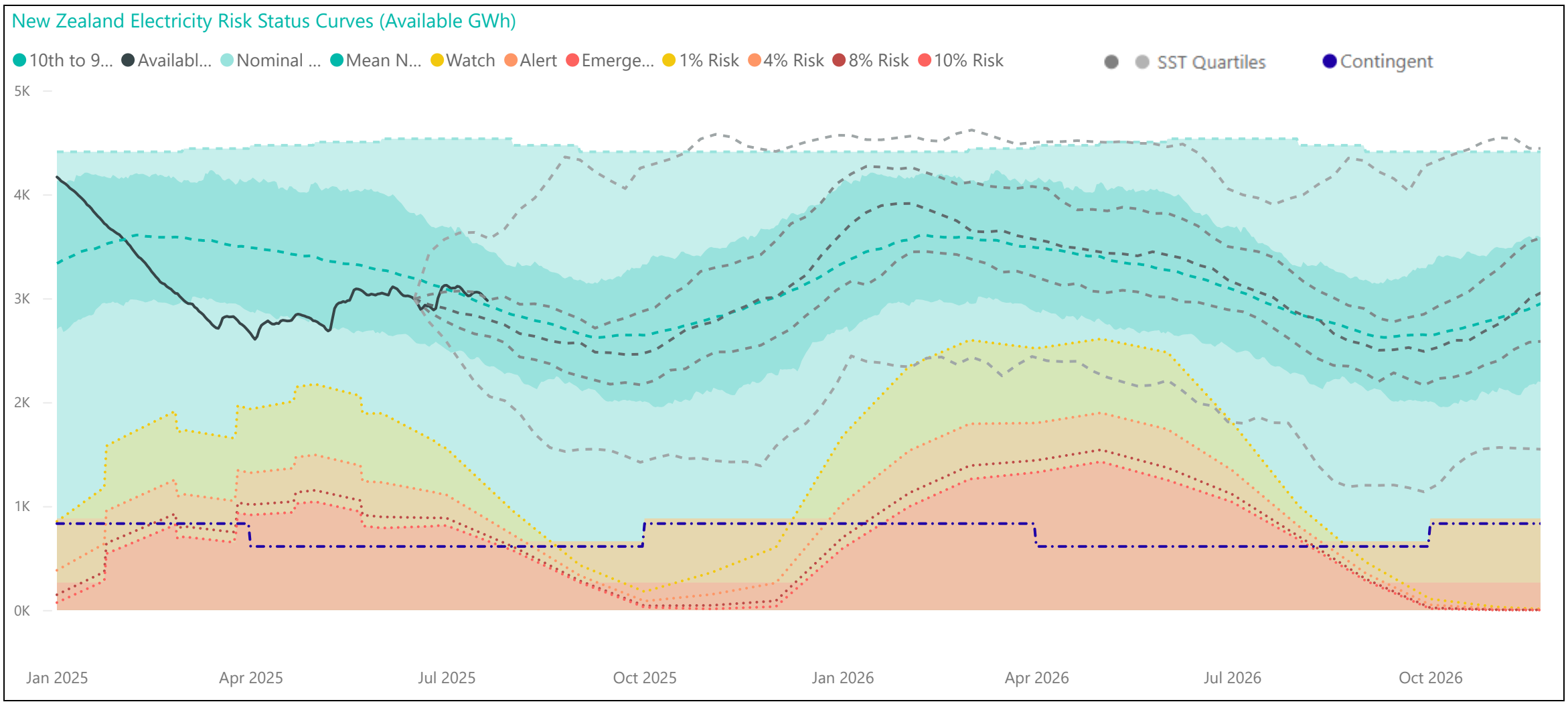
For any inquiries related to security of supply contact market.operations@transpower.co.nz

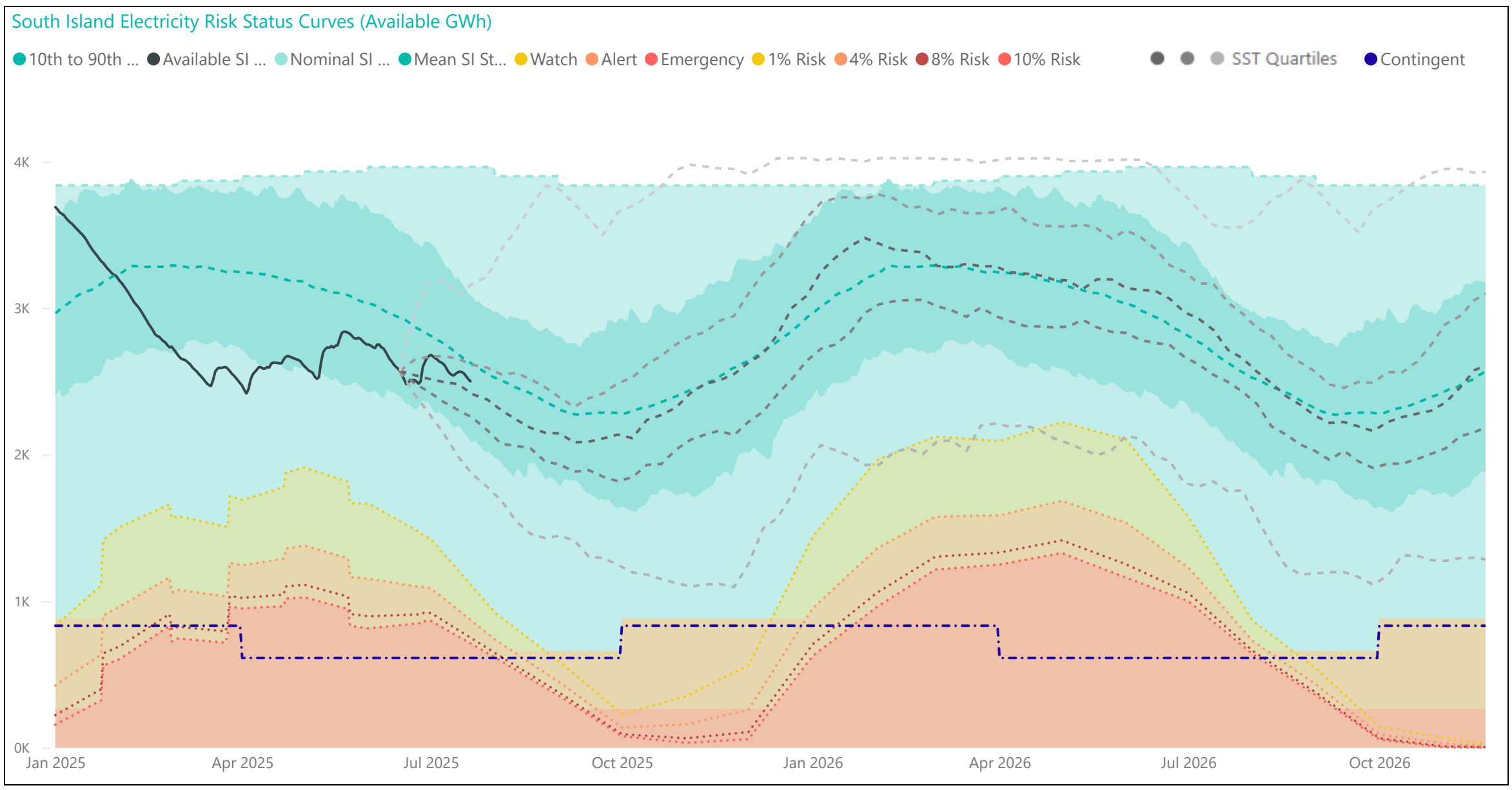
Hydro data used in this report is sourced from *NZX Hydro*.

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).