Market Operations Weekly Report - Week Ended 7 September 2025

Overview

New Zealand hydro storage increased to 83% of the mean for this time of year. Capacity margins were relatively healthy last week with over 700 MW of residual during all peak demand periods.

This week's insight provides an overview of intermittent generation curtailment on the grid and how frequently they are constrained.

Security of Supply

Energy

New Zealand hydro storage increased after above average inflows and below average hydro generation, rising from 77% of the historic mean to 83% over the past week. South Island hydro storage picked up from 73% to 80% of historic mean and North Island storage remained at 104%.

Capacity

Capacity margins were relatively healthy last week with residual at all peaks exceeding 700 MW. The lowest residual occurred on the morning of Wednesday 3 September, at 735 MW. This coincided with low wind generation and the highest demand peak during the week.

The N-1-G margins in the NZGB forecast are healthy through to the start 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 remained at exactly 821 GWh. The highest demand peak occurred at 7:30am on Wednesday 3 September, at 6,302 MW.

Weekly Prices

The average wholesale electricity spot price at Ōtāhuhu last week increased to $182/MWh from $148/MWh the week prior in line with decreased hydro generation and increased thermal. Wholesale prices peaked at $351/MWh at Invercargill at 6:00am on Monday 1 September.

Generation Mix

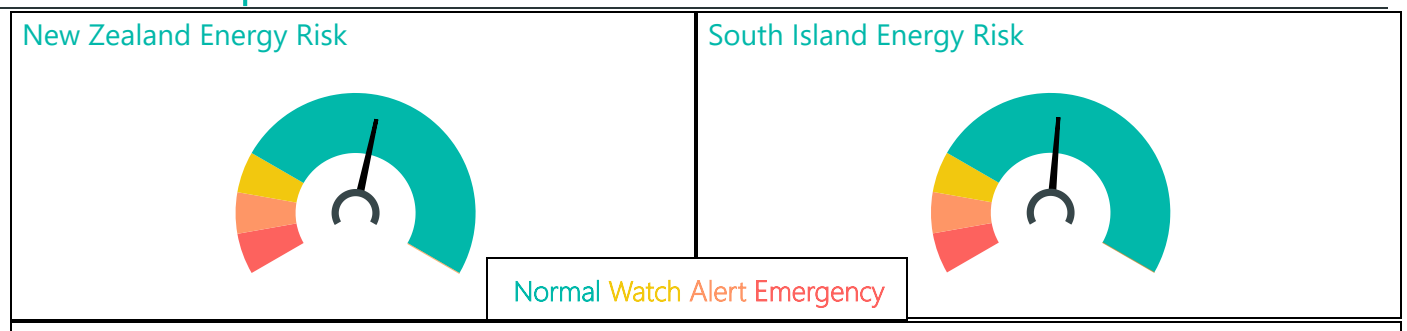
Hydro generation contributed 52% of the generation mix last week, 1% lower than the previous week. Wind generation increased from 9% to 13% of the mix. Thermal generation increased from 11% to 13% with lower hydro generation. The geothermal share remained close to its average level at 23% of the mix.

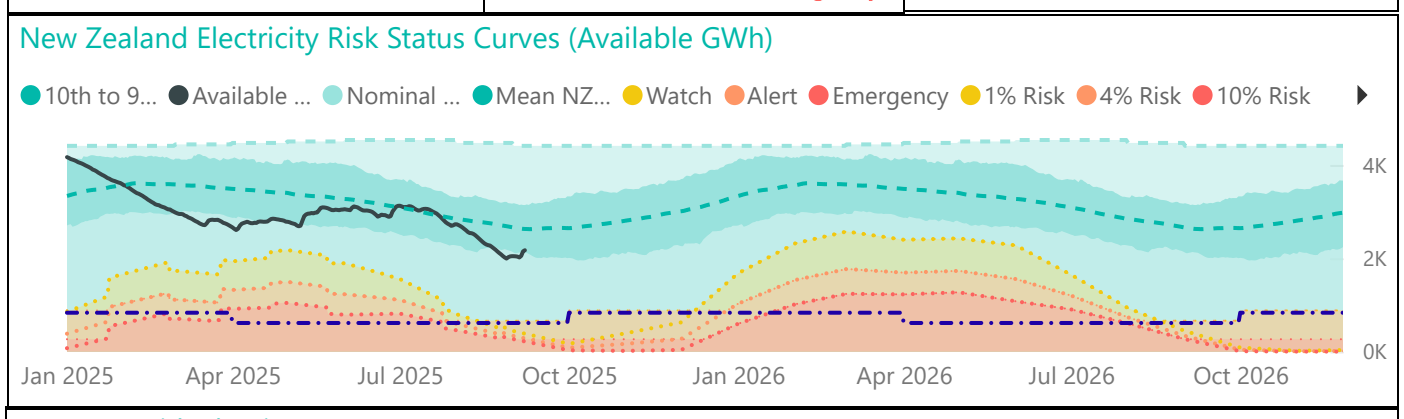
HVDC

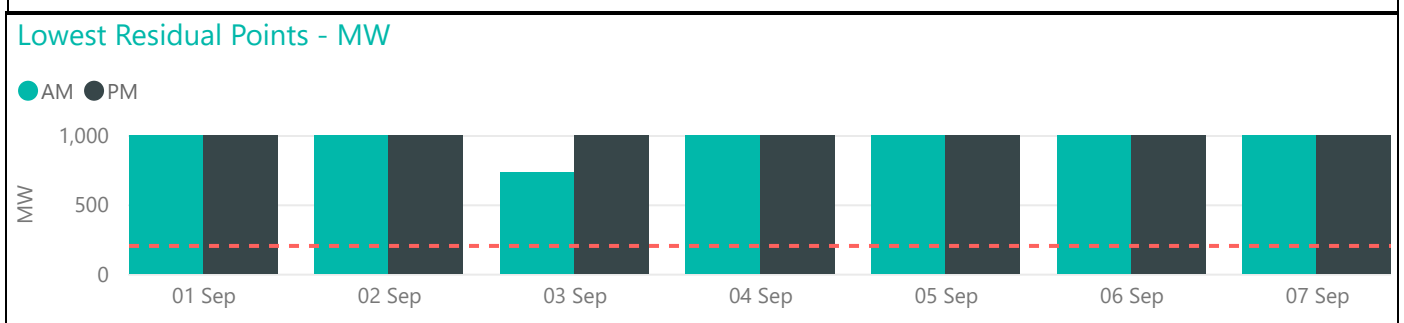
HVDC flow last week was predominantly southward with the exception of Wednesday and Saturday which saw high northward flow during the day. In total, 22 GWh was sent south and 12 GWh was sent north.

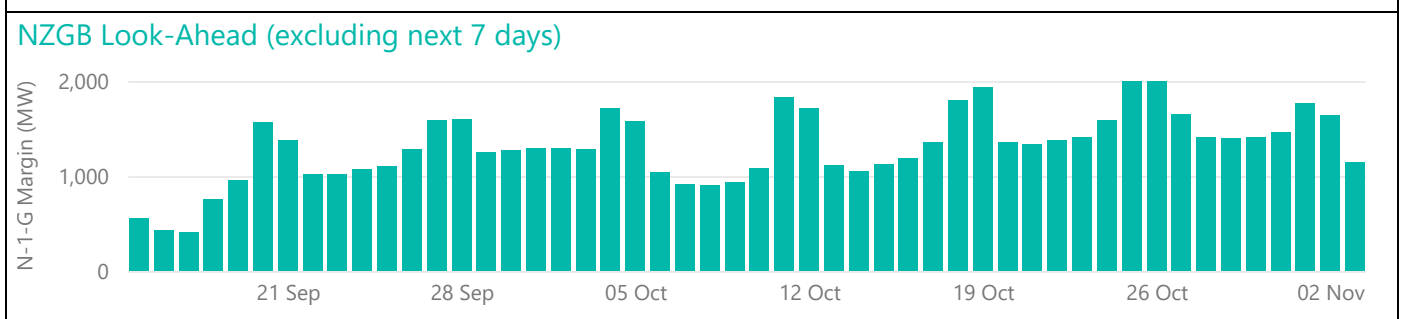
CACTIS Consultation Open

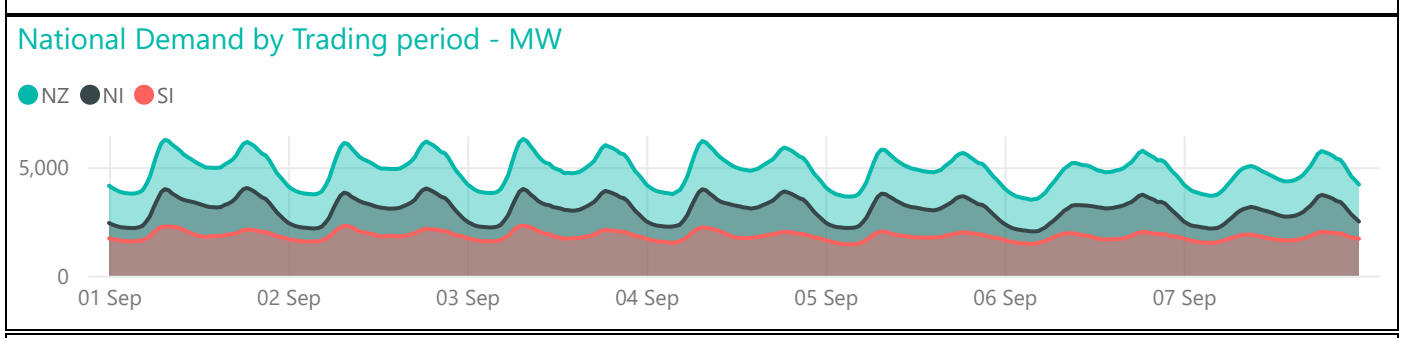
Consultation to seek feedback on the proposed Connected Asset Commissioning, Testing and Information Standard (CACTIS) opened on 1 September. The closing date for submissions is 29 September. More information on this consultation can be found here.

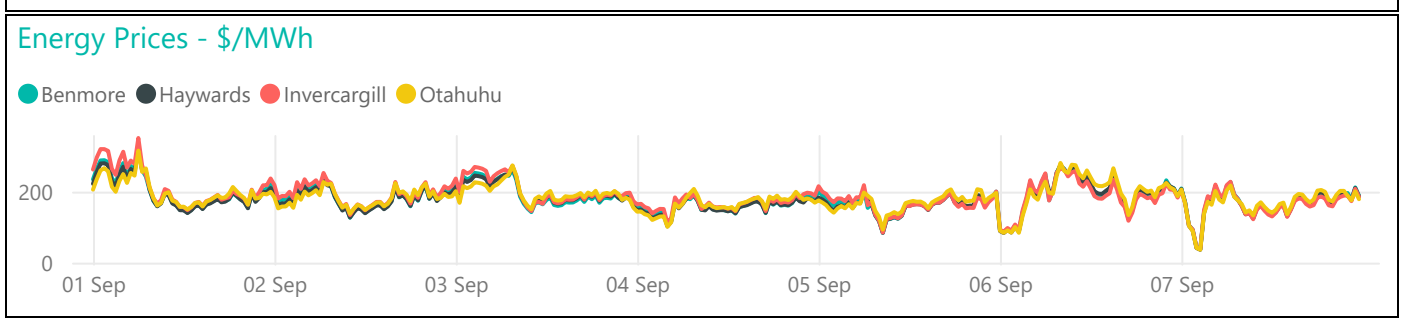


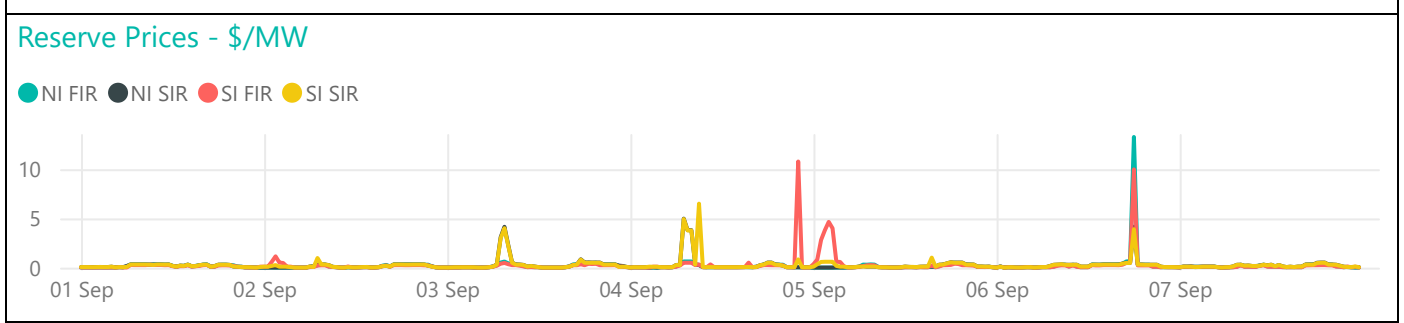


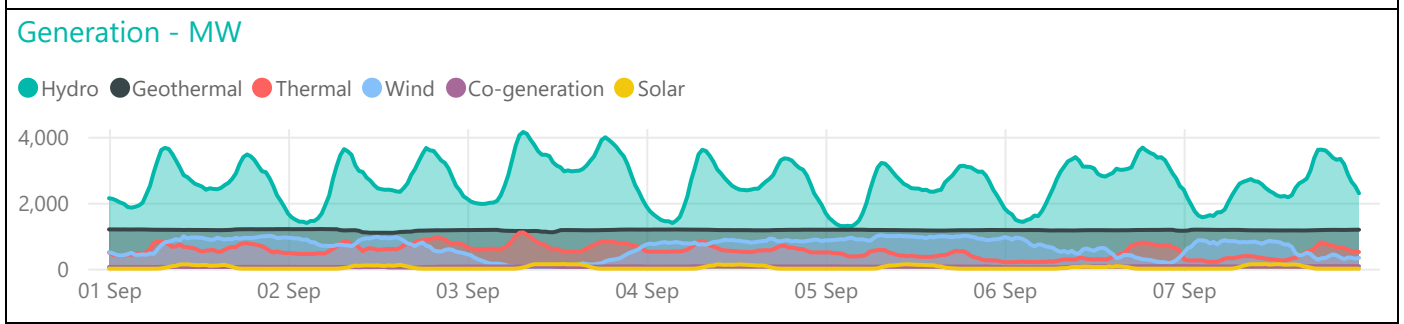


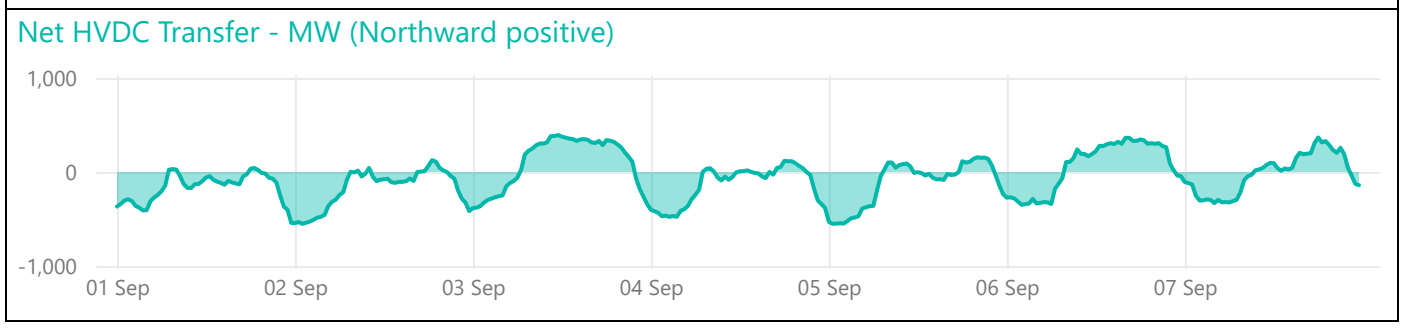












Weekly Insight - IG flags and wind/solar curtailment

Intermittent generation (IG), such as wind and solar, plays an increasingly important role in New Zealand's electricity system. By design, dispatches are sent to these farms to follow their current output. They are free to generate up to their maximum potential at (almost) any point in time, depending on the available wind or solar resource. This ensures the system captures as much of this "free" renewable generation as possible.

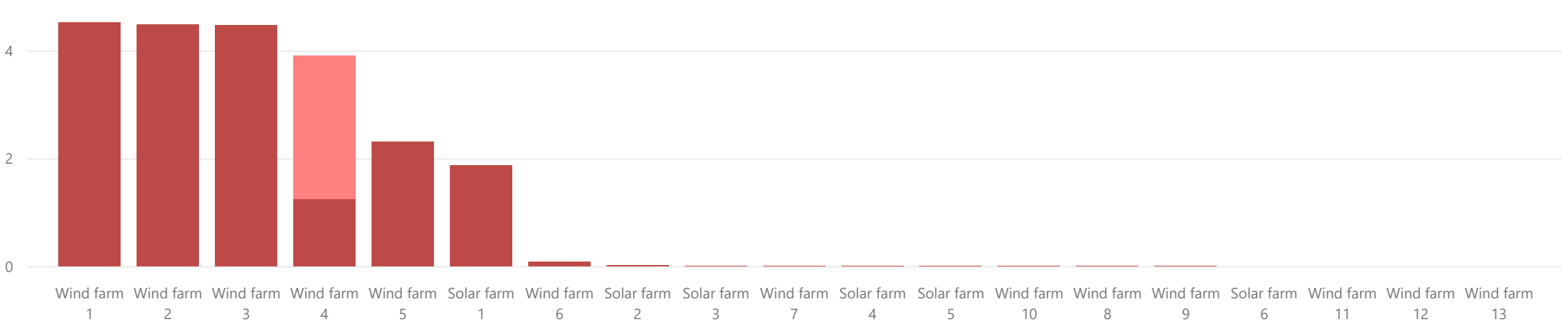
However, there are circumstances where intermittent generators receive a dispatch instruction with an "IG flag". This effectively caps their output, requiring them to dial back from what they could otherwise produce. The reasons for this can include:

- Price signals – if the market clearing price is below the IG farm's offer price, limiting its dispatch may be more efficient in balancing supply and demand.
- Risk group constraints – multiple intermittent sites may be treated as a single risk to system security, resulting in capped generation across the group.
- Transmission constraints – if local transmission infrastructure cannot absorb additional power, generation must be constrained to avoid overloading the grid.

Figure 1 illustrates how many IG-flagged dispatch instructions were sent over the last three months across different wind and solar farms, highlighting that while most of the time they are free to run, some sites face more frequent constraints than others.

% of Dispatches with IG Constraint

Price > $0.01/MWh False True

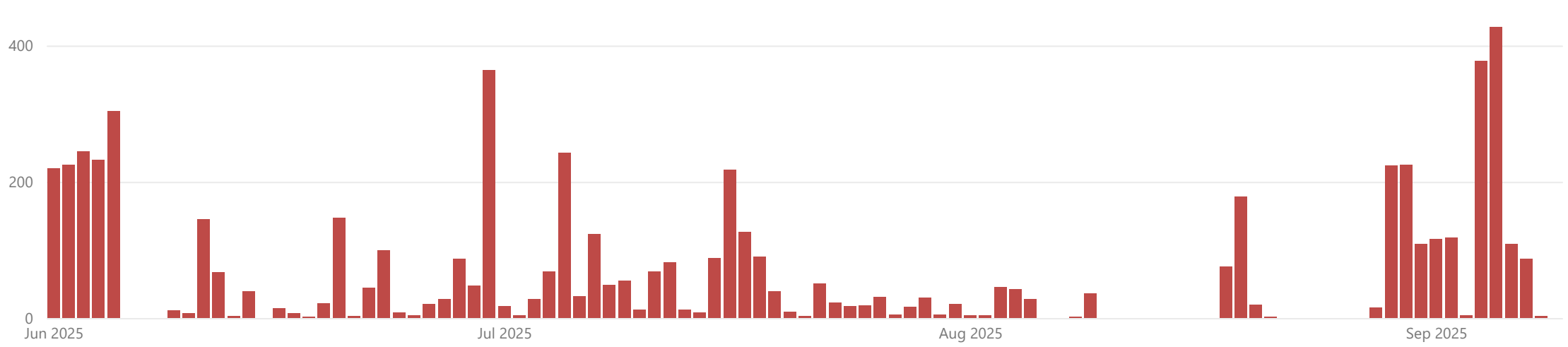


The first three wind farms have received IG flags in almost 5% of dispatches from the past three months. These three wind farms form a risk group (see CAN) which is treated as a single risk for the tripping of a transmission line in the region (see previous insight on group risks here). Because of this, SPD will sometimes constrain back these farms to avoid procuring more reserves if economically viable to do so.

Offer price can also result in IG flags. A wind farm offering at higher prices (e.g. higher than $0.01/MWh) may see more IG flags. If the energy price falls below its offer price, it cannot be dispatched at its full potential, so the system operator issues an IG flag to cap its generation. The effects of this can be seen for Wind farm #4.

Figure 2 displays from the same dataset the frequency of IG flags over time, showing when and how often intermittent generation is being curtailed. Since June, roughly 1.3% of all dispatch instructions to an intermittent generator have been sent with the IG flag (i.e. constrained down). In other words, ~99% of the time, New Zealand is getting the maximum potential output from its intermittent renewable resources.

IG Flags sent

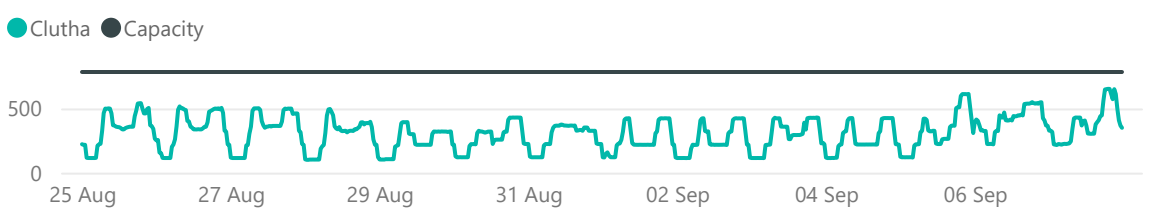


Looking ahead, the proportion of IG flags is likely to increase as intermittent generation takes up a larger fraction of the NZ generation fleet. This will place added pressure on transmission infrastructure and system balancing mechanisms, making efficient grid investment and flexible demand-side responses increasingly important.

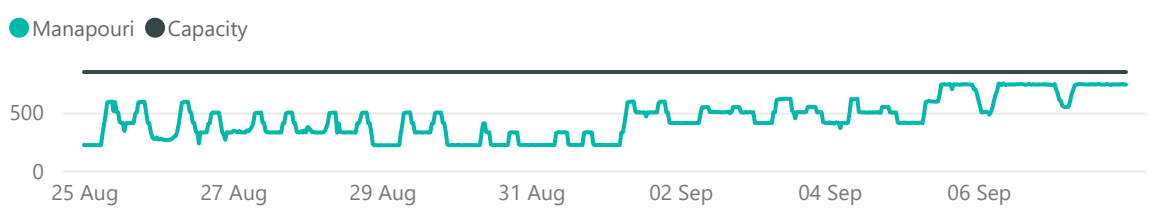
Generation Breakdown - Last Two Weeks

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

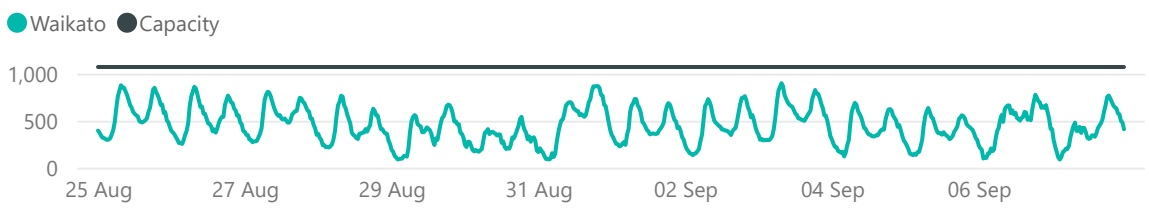
Clutha



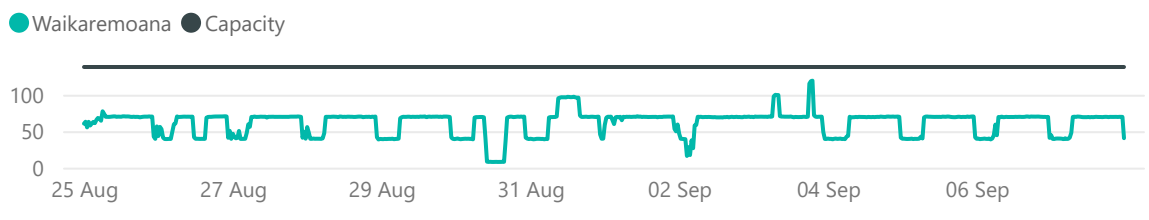
Manapouri



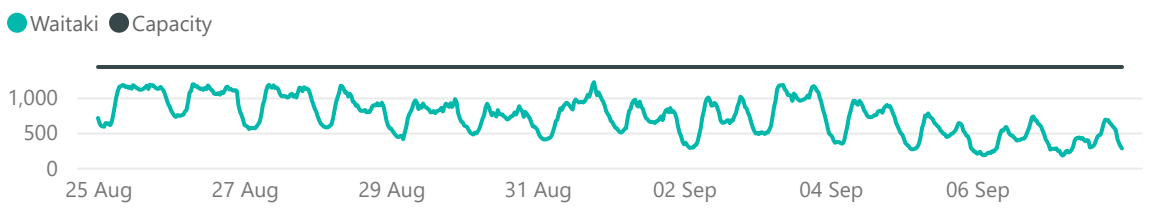
Waikato



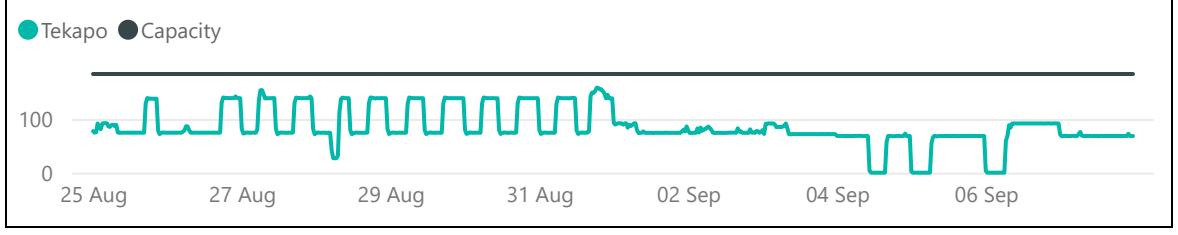
Waikaremoana



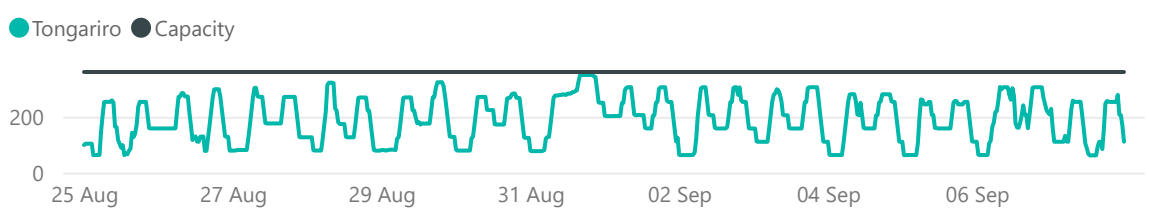
Waitaki



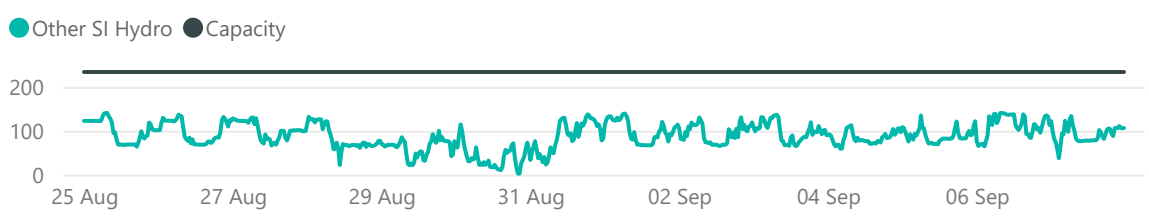
Tekapo



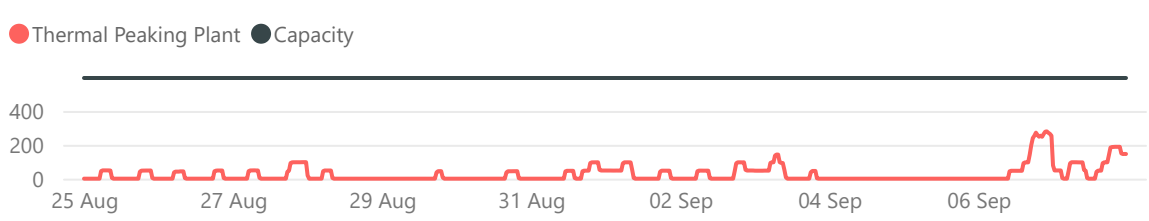
Tongariro



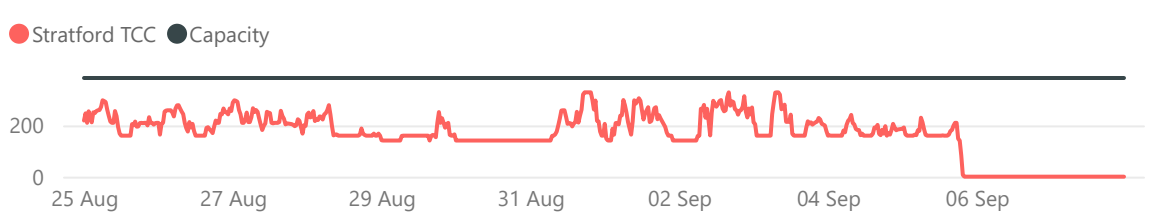
Other SI Hydro



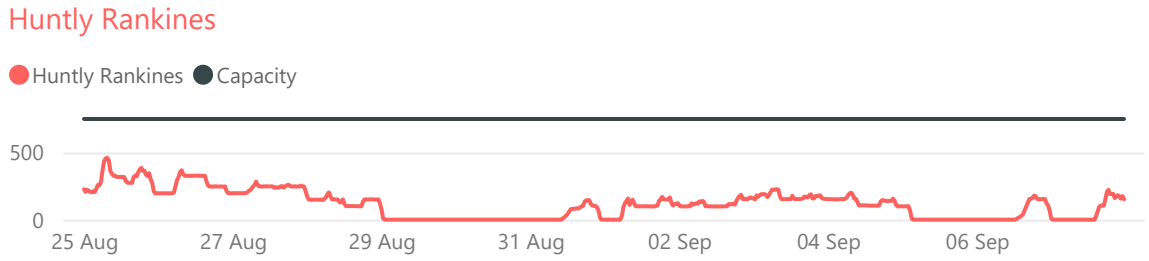
Thermal Peaking Plant



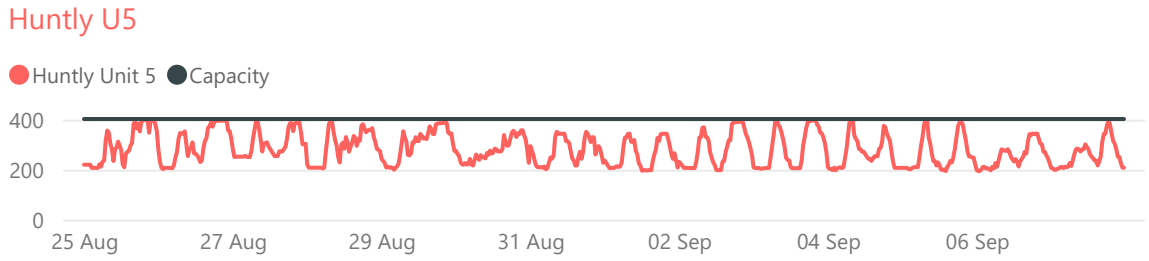
Stratford TCC



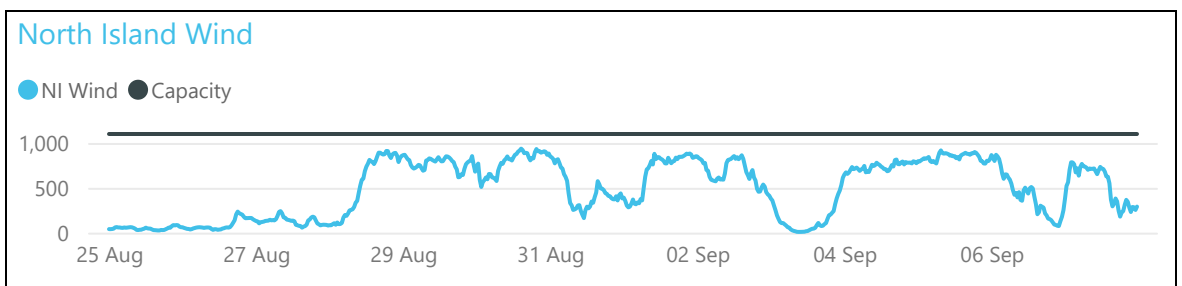
Huntly Rankines



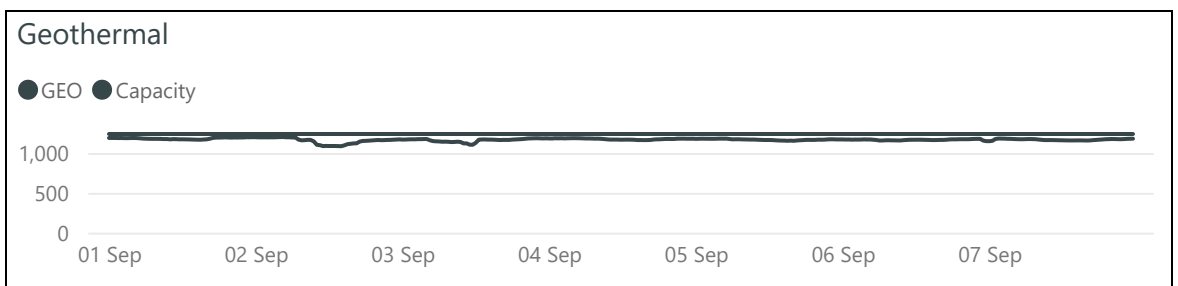
Huntly U5



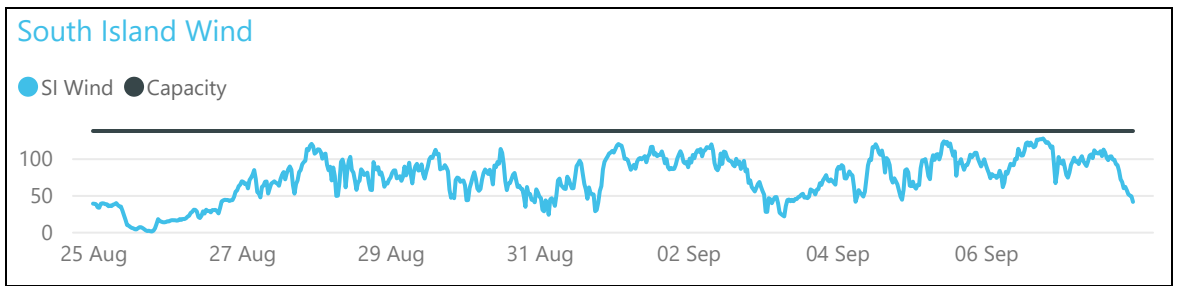
North Island Wind



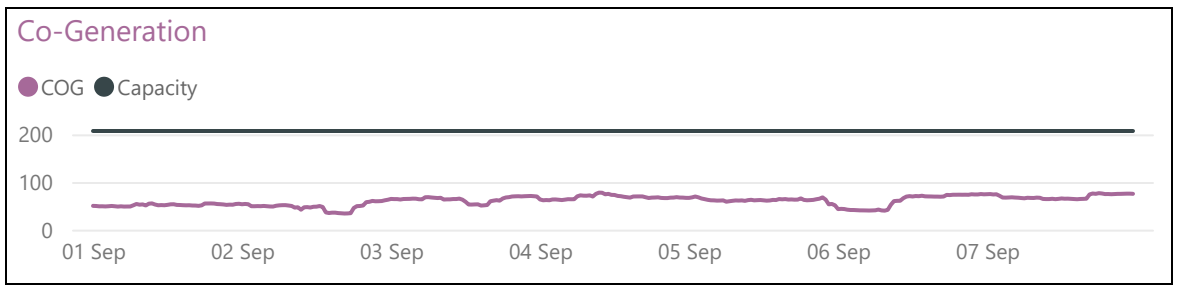
Geothermal



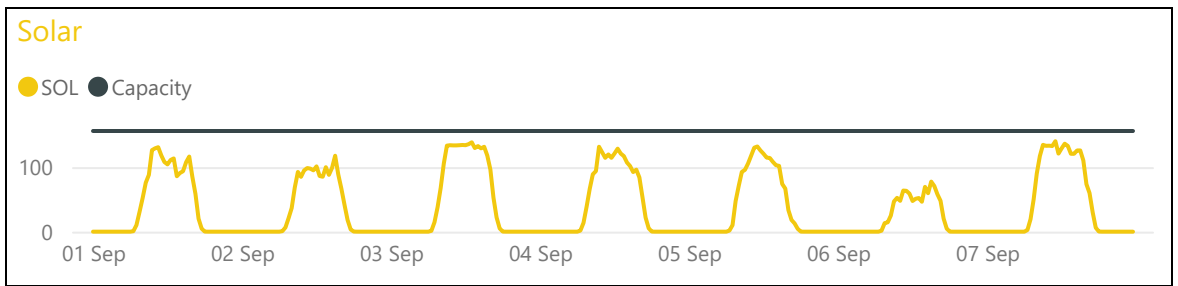
South Island Wind



Co-Generation

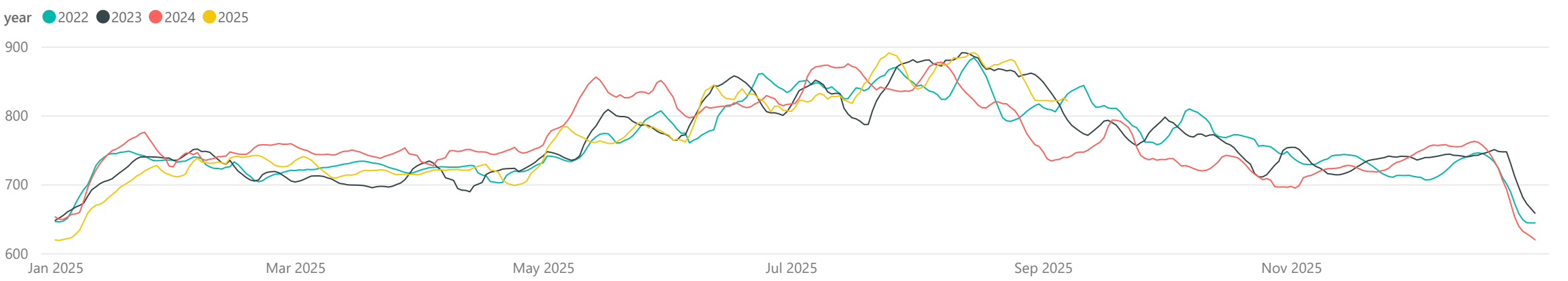


Solar

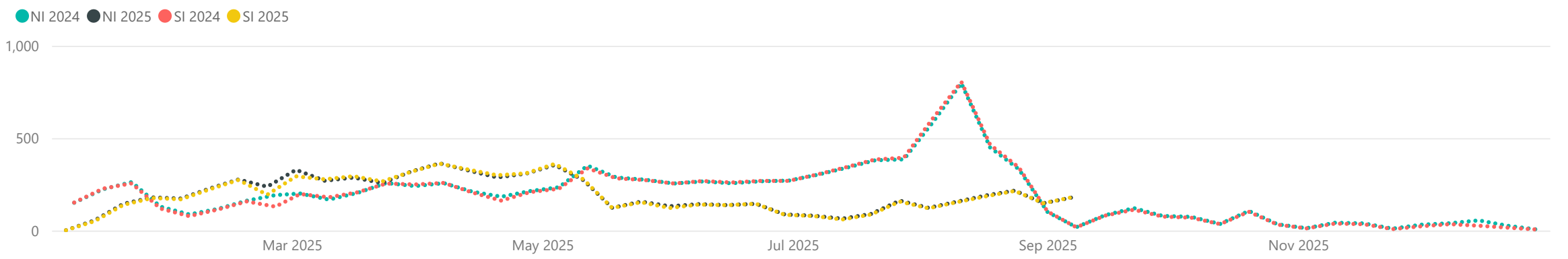


Weekly Profiles

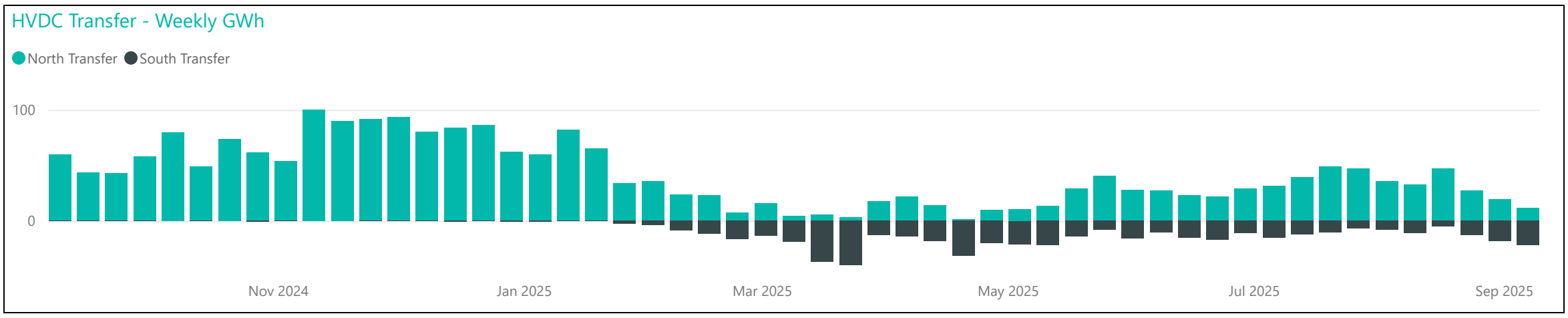
National Weekly Demand - GWh - 7 Day Rolling



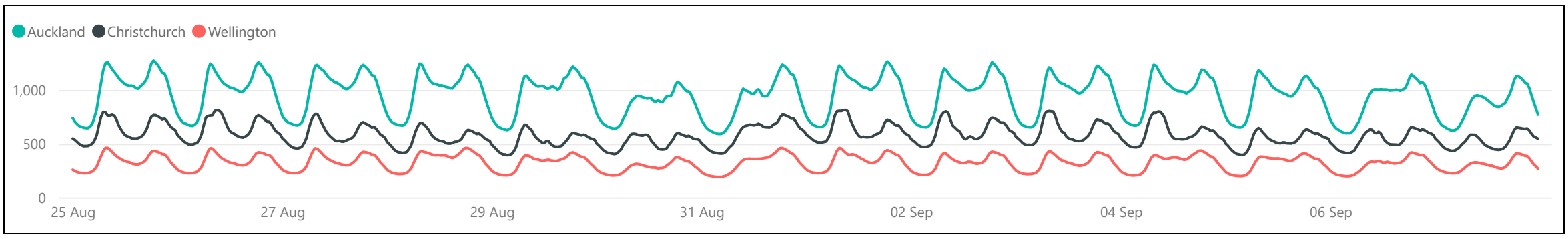
Weekly Spot Price - $/MWh



HVDC Transfer - Weekly GWh

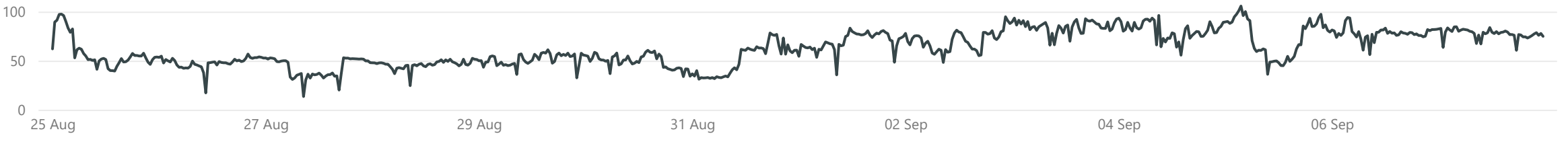


Conforming Load Profiles - Last Two Weeks *Measured in MW shown by region*



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

GLN0331



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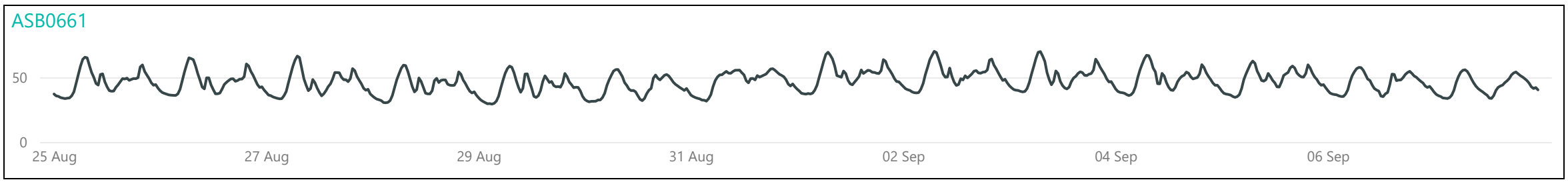

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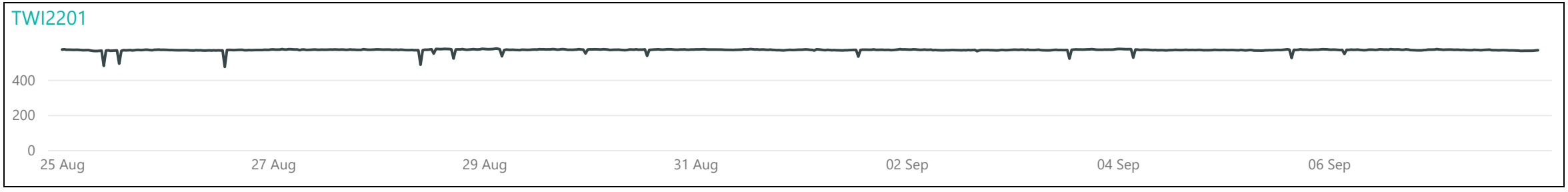
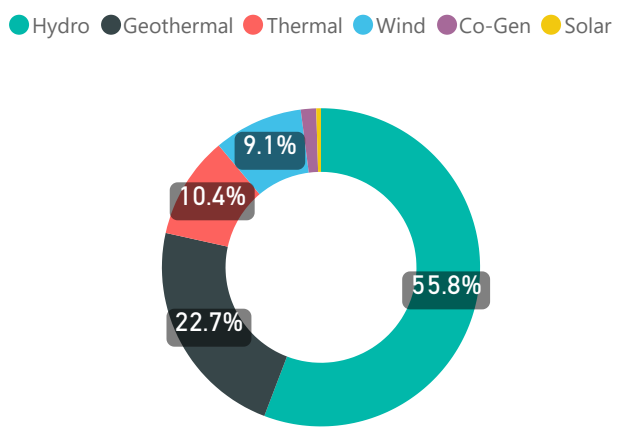


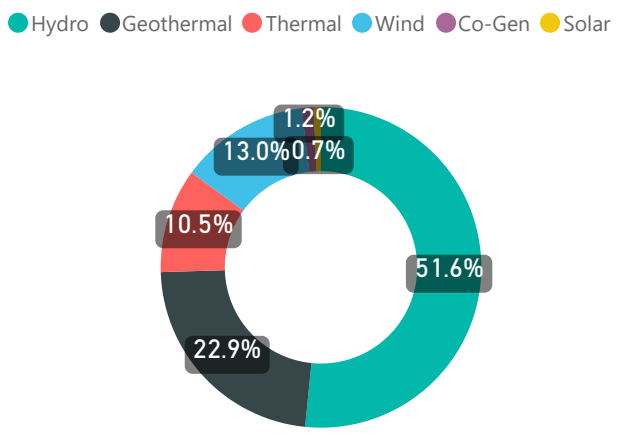
TRANSPOWER

Generation Mix

Last 52 Weeks Generation Mix - Weekly GWh



Last 7 Days Generation Mix - Weekly GWh



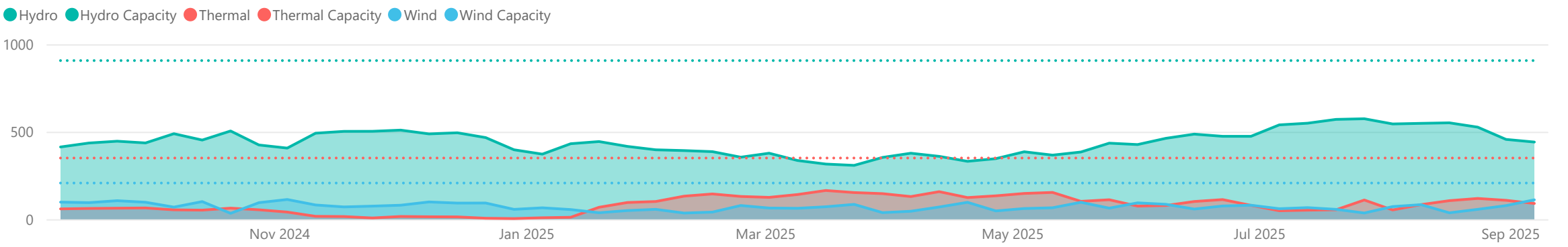
Average Metrics Last 7 Days

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
88%	66,511	77.3

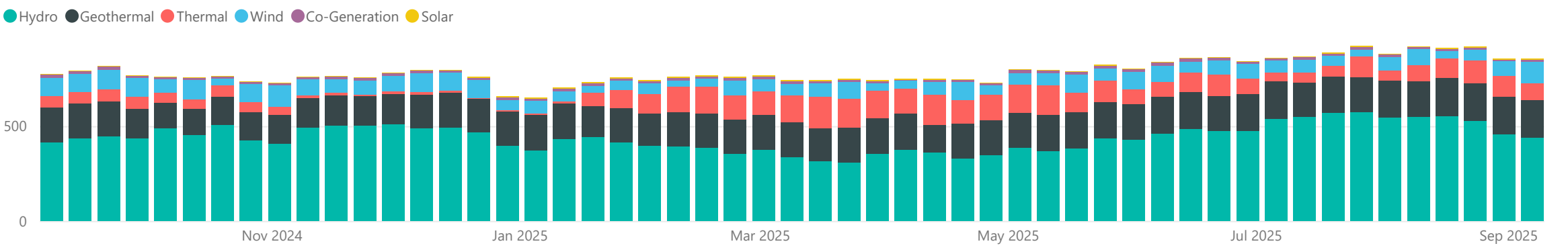
Average Metrics Last 52 Weeks

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
88%	67,129	84.8

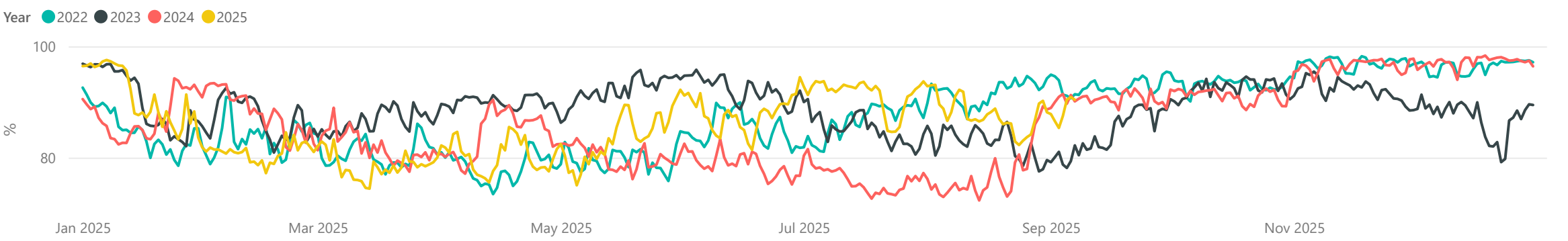
Weekly Generation Mix vs Capacity - GWh



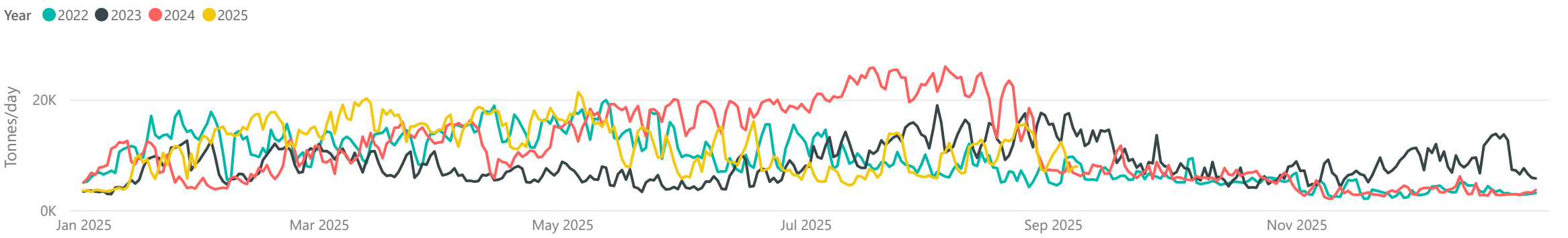
Weekly Generation Mix - GWh



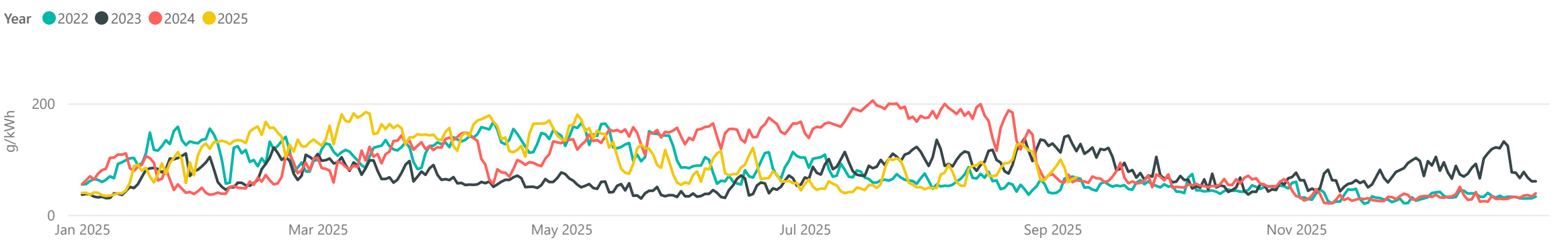
NZ Renewable Percentage



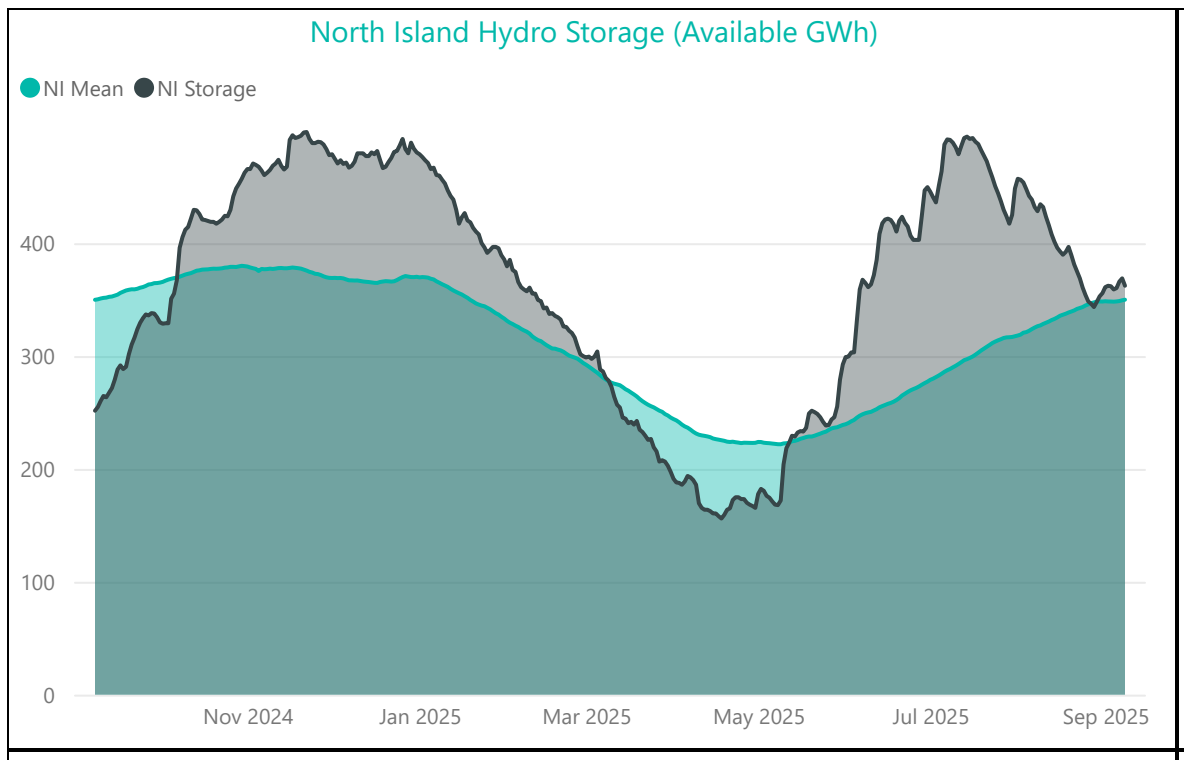
CO2 Tonnes/Day

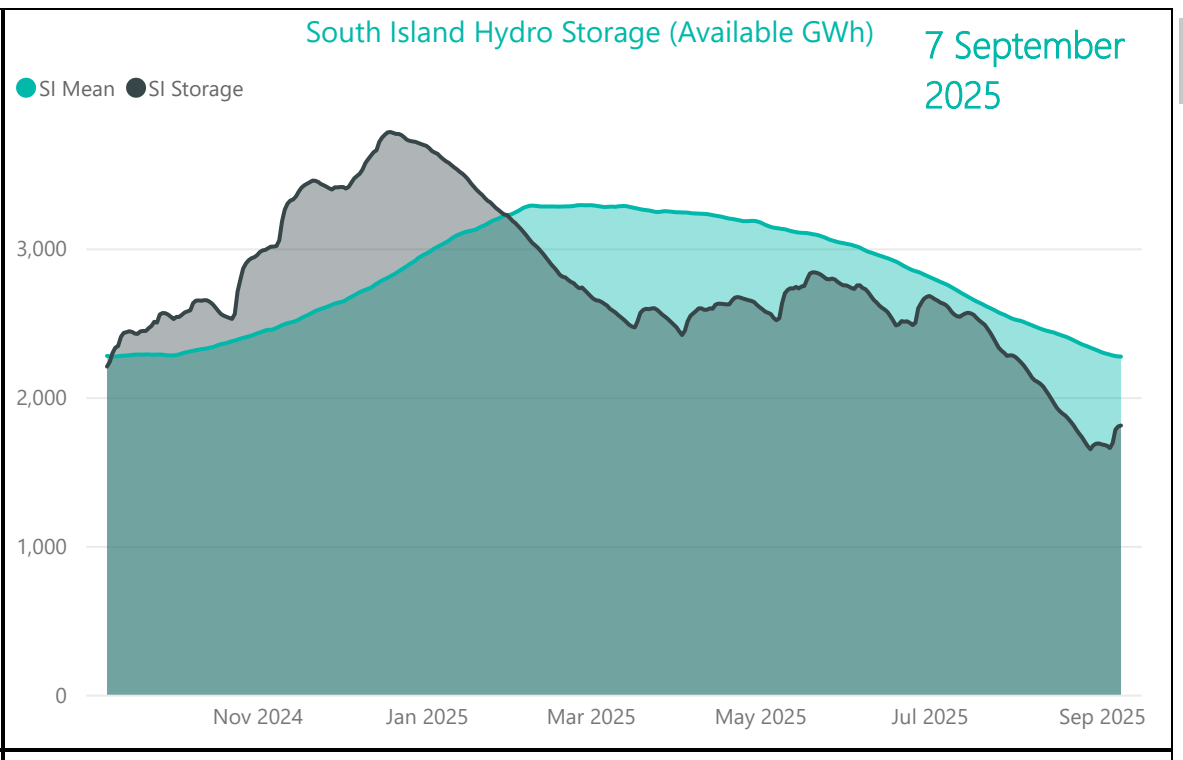


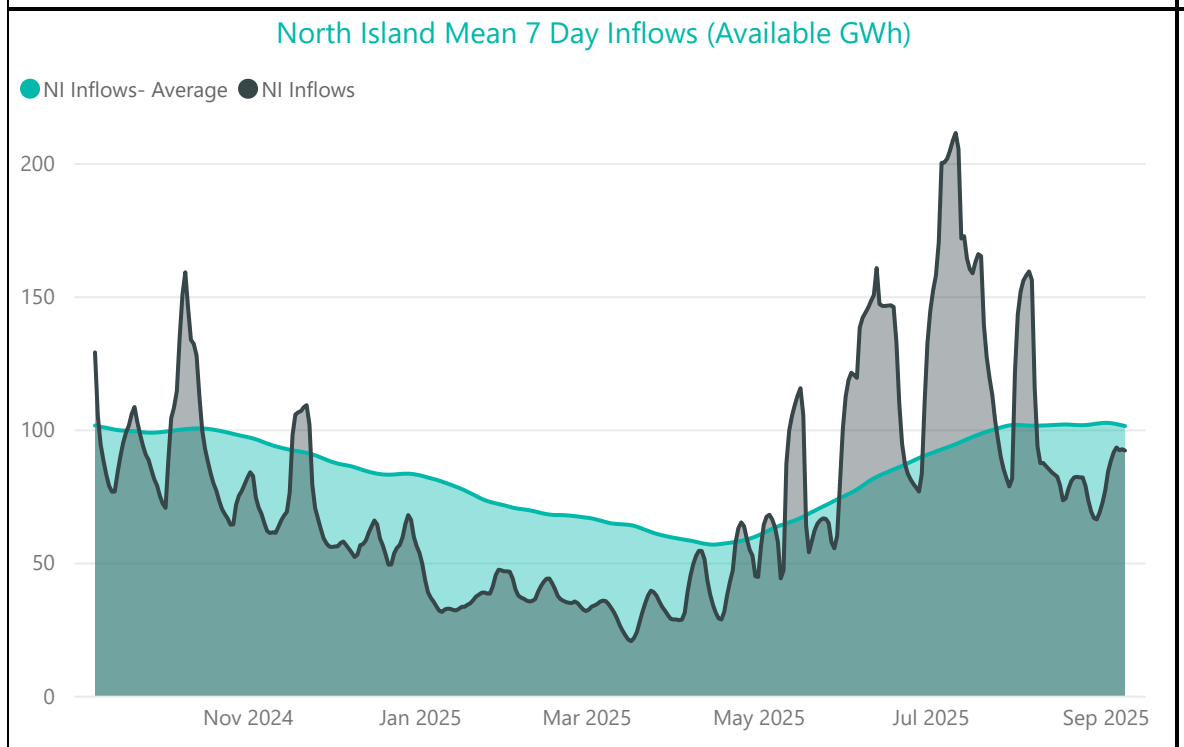
CO2 g/kWh

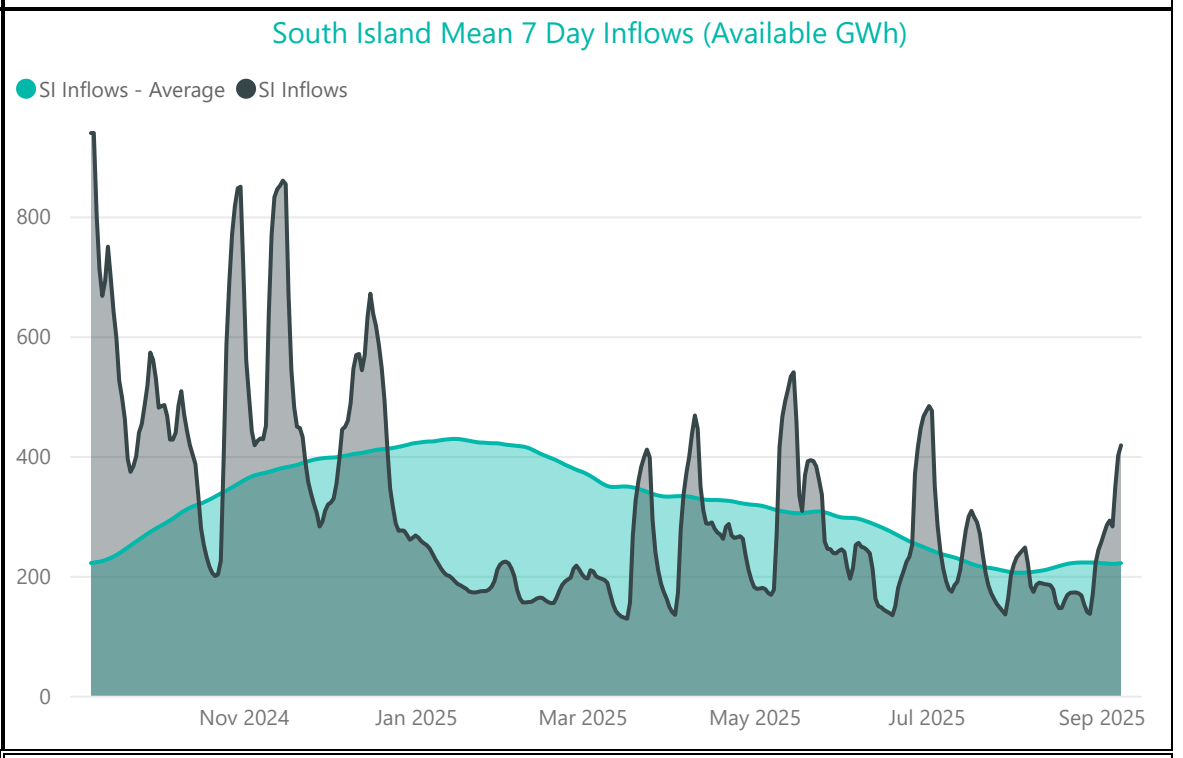


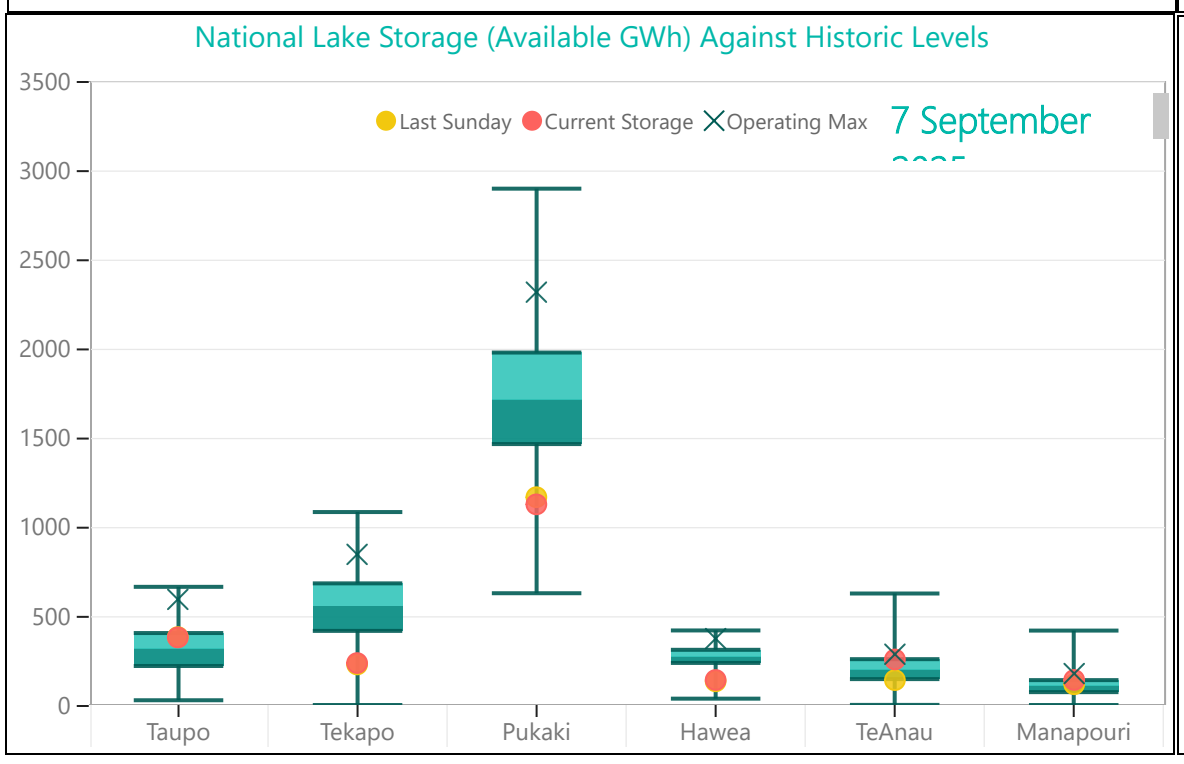
Hydro Storage

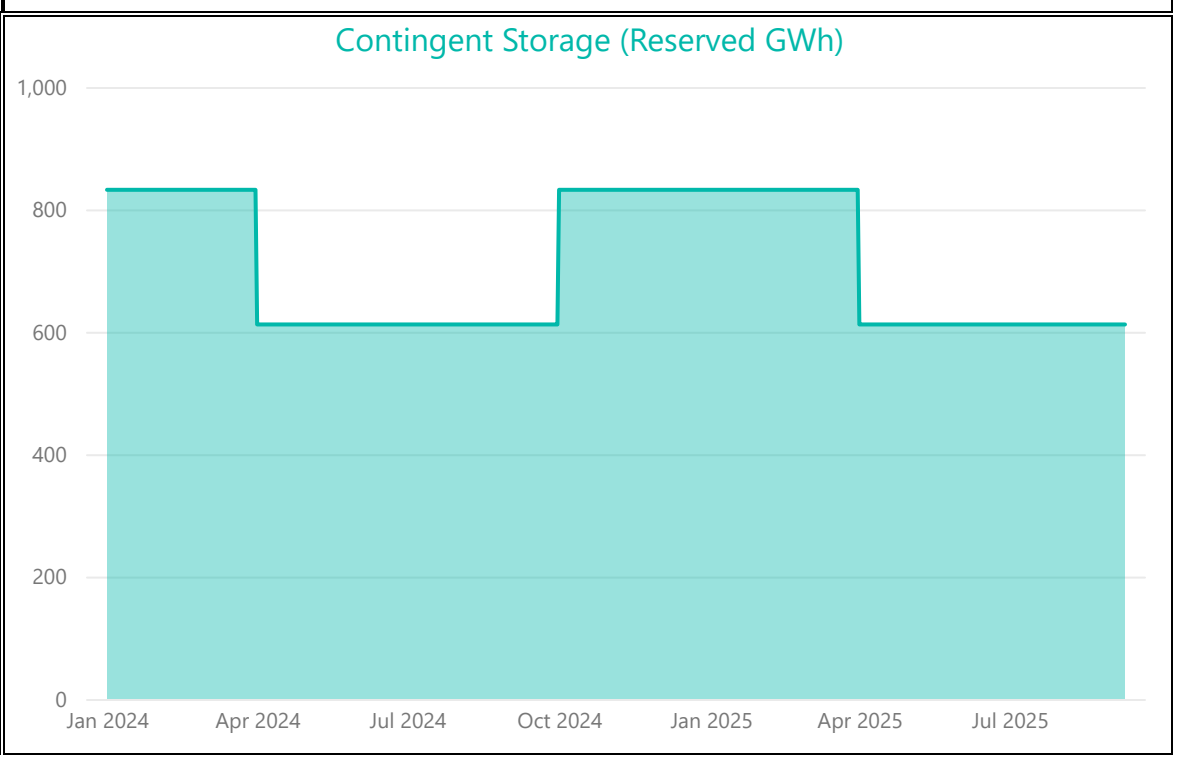












For further information on security of supply and Transpower's responsibilities as the System Operator, refer to our webpage here: https://www.transpower.co.nz/system-operator/security-supply

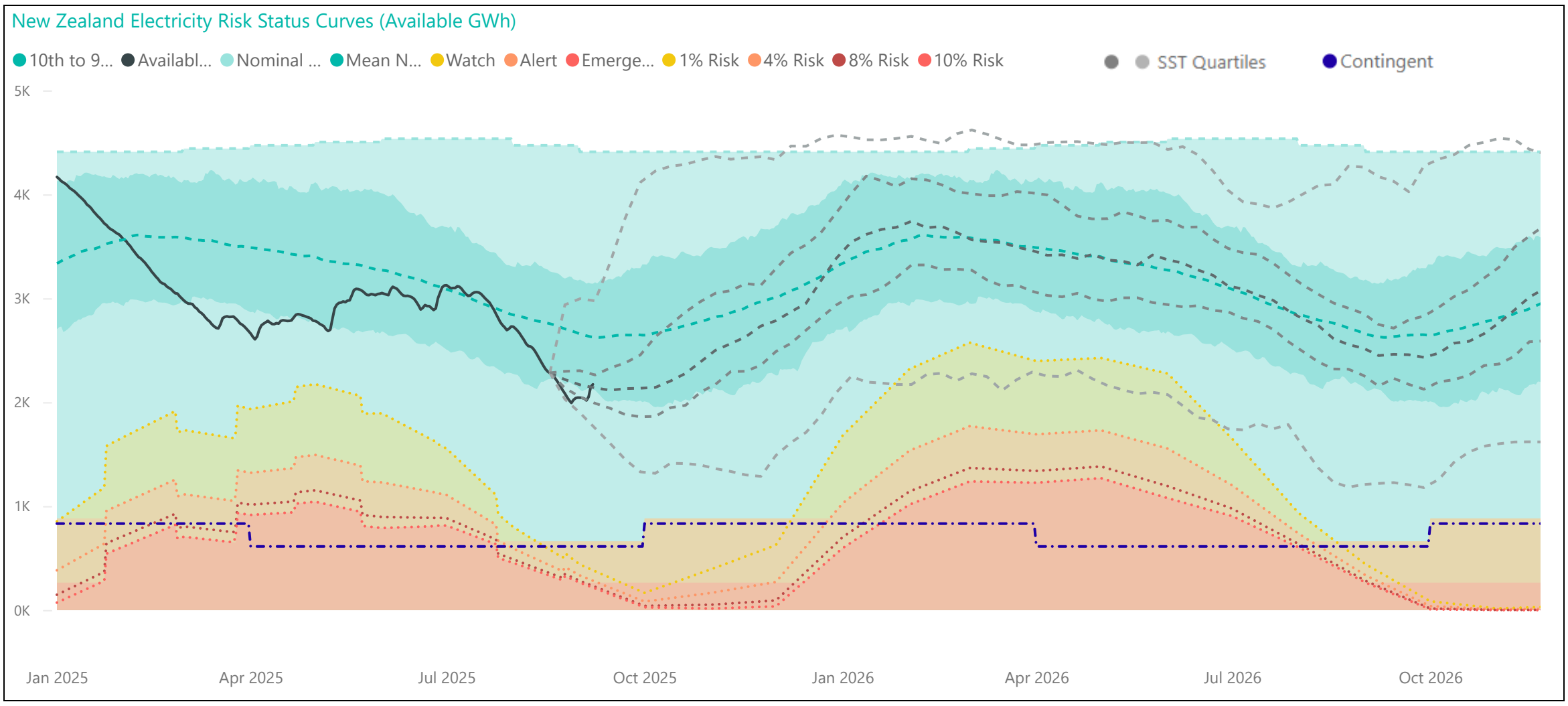
For any inquiries related to security of supply contact market.operations@transpower.co.nz

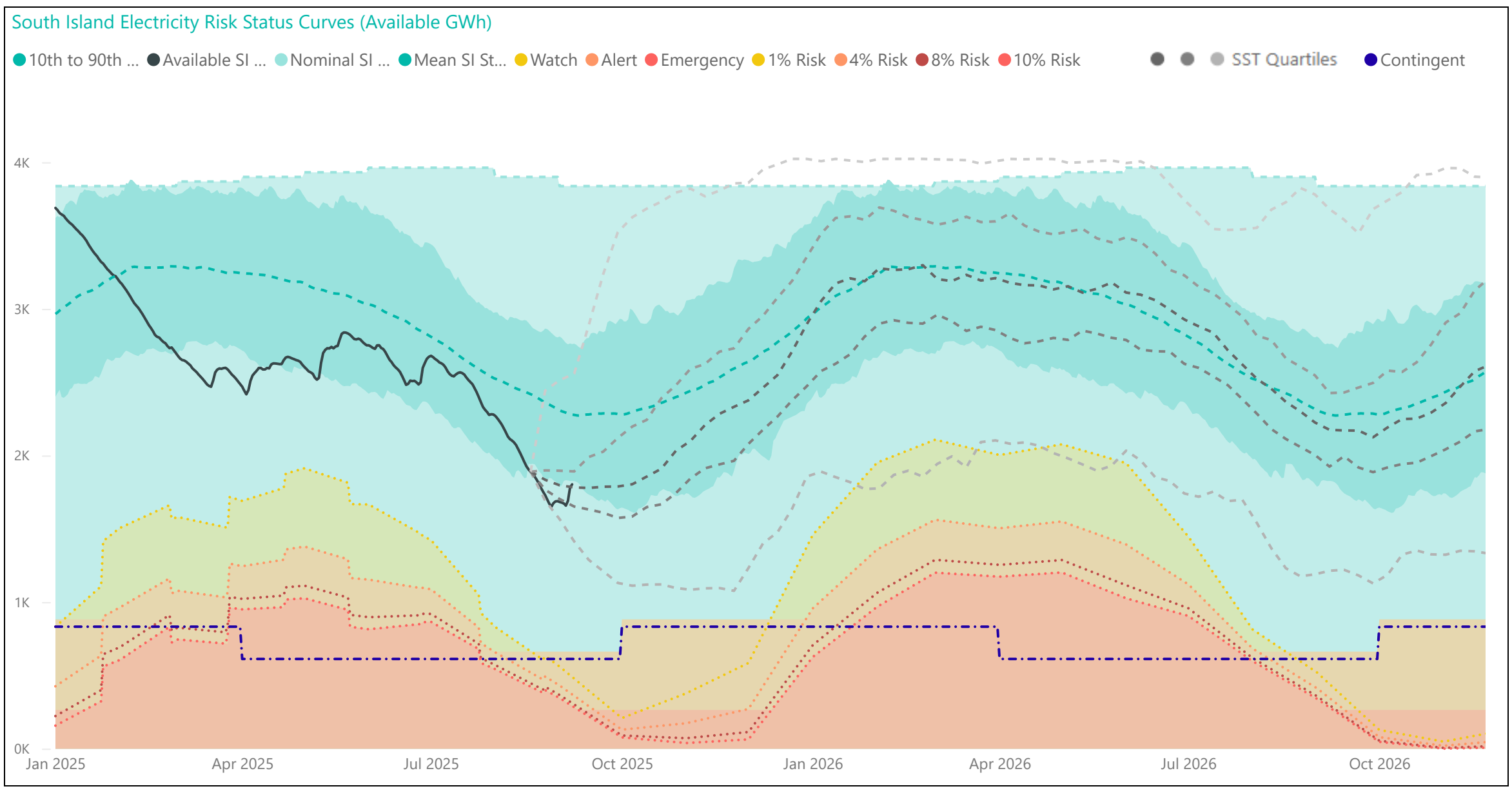
Hydro data used in this report is sourced from *NZX Hydro*.

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).