

Weekly Market Movements - Week Ended 23 July 2023

Overview

National hydro storage remained high at 118% of the mean for this time of year. Mild weather, high wind generation, and high thermal commitment continued from last week resulting in healthy residual generation.

We are still monitoring potential tight points identified in NZGB for August 3 and 4.

In this week's Market Insight we look at price volatility for June and July.

Security of Supply

Energy

National hydro storage has dropped slightly to 118% of the historical mean from 119%. It remains above the 90th percentile of historic storage for this time of year. South Island storage remains at 118% of mean while North Island storage has dropped from 125% to 115% of the historic mean.

Capacity

Residual generation remained healthy last week as a result of mild weather, high wind generation and continued high thermal commitment in the absence of Huntly unit 5. The Huntly unit 5 outage has been updated in POCP (Planned Outage Coordination Process) to run until August 31.

Reflecting this extended outage, the N-1-G margins for the NZGB look-ahead have dropped across August. Notably, the margin has dropped below zero for the 3rd and 4th of August. The System Operator has issued a [Customer Advice Notice](#) (CAN) for these two dates. In the CAN, the System Operator recommends that generators and Transpower as the Grid Owner consider rescheduling outages and avoid scheduling any further outages for these dates.

The latest NZGB report is available on the [NZGB website](#).

Electricity Market Commentary

Weekly Demand

National demand over the week was 831 GWh, a 4% increase from the previous week. This was driven in part because demand the previous week was lower due to the Matariki public holiday. National demand peaked at 6,389 MW at 6:00pm Thursday 20 July.

Weekly Prices

Average wholesale prices increased from \$92/MWh the previous week to \$100/MWh at Haywards, and from \$90/MWh to \$99/MWh at Benmore. We continue to see decreased price volatility with extended periods of near-constant prices (for example 19 July 5:00 am to 10:00 pm). Prices at Otahuhu peaked at \$204/MWh on Sunday 23 July at 5:30pm during a demand peak concurrent with low wind generation.

Generation Mix

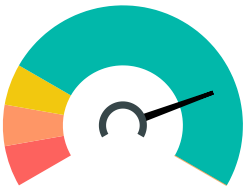
Thermal generation remained relatively high throughout the week, contributing 18.4% to the generation mix, up from 14.4% the week prior. Wind generation remained high at 9.2% of the generation mix, despite low wind generation on Thursday and over the weekend.

Hydro generation remained consistent, but dropped from 57% to 54% of the generation mix as thermal generation increased. Reflecting this, the renewable contribution to the generation mix dropped to 80% last week from 84% the previous week.

HVDC

The HVDC flow continued to follow the pattern of northward flow during the day and southward flow overnight with the exception of some southward flow early in the afternoon on Saturday. This could be attributed to low South Island temperatures and higher load combined with high North Island thermal generation.

New Zealand Energy Risk

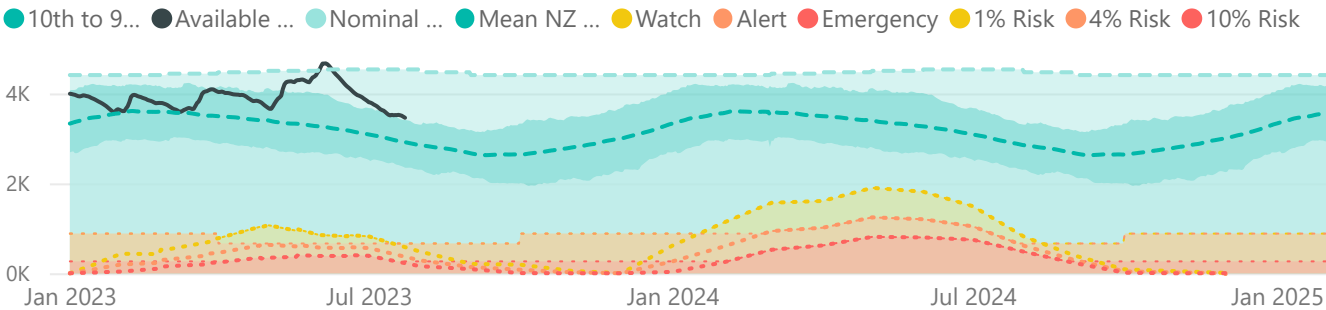


South Island Energy Risk

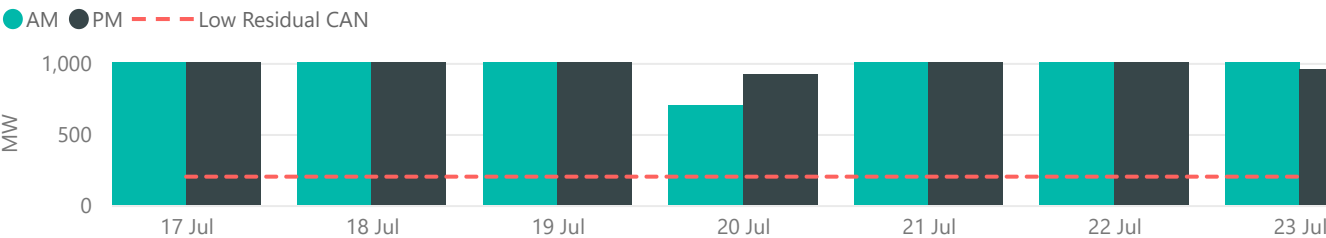


Normal Watch Alert Emergency

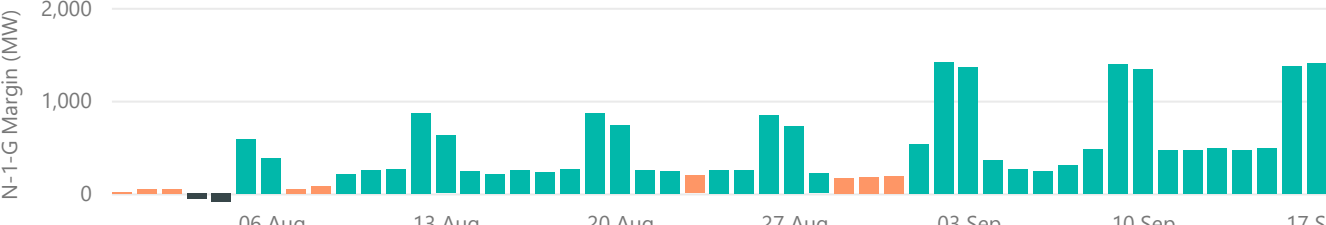
New Zealand Energy Risk Status Curves (Available GWh)



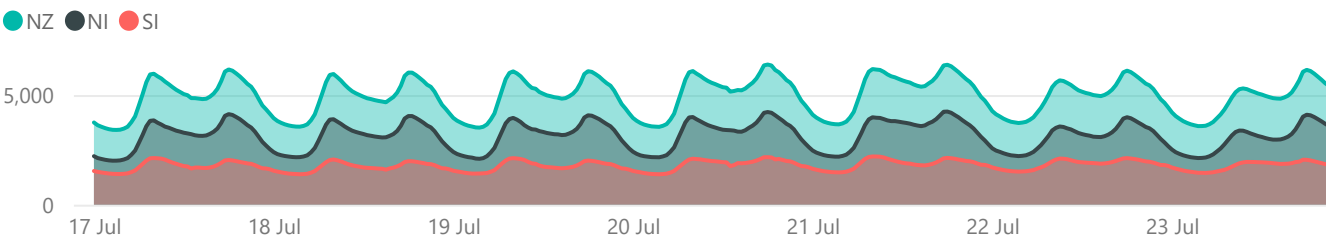
Lowest Residual Points - MW



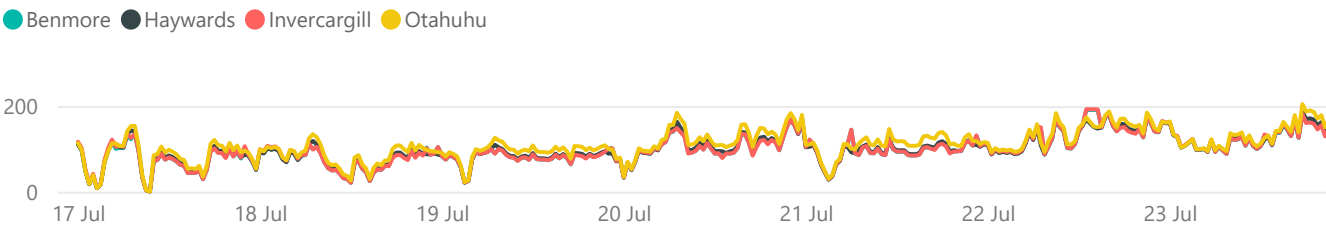
NZGB Look-Ahead (excluding next 7 days)



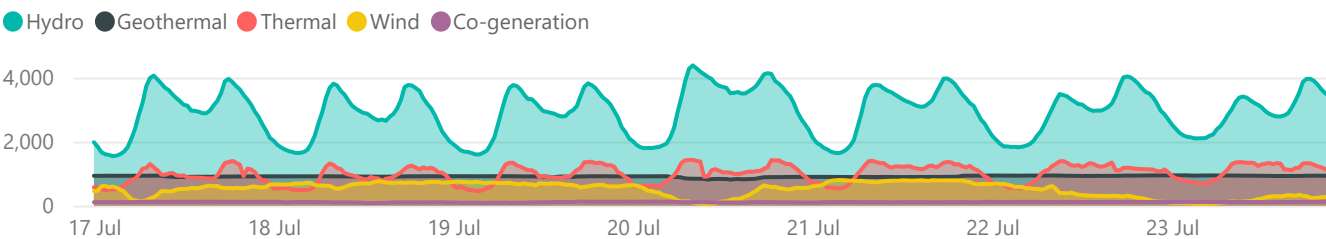
National Demand by Trading period - MW



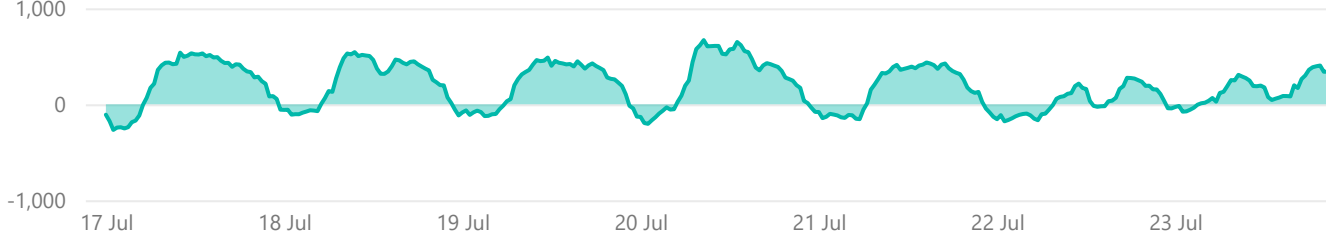
Weekly Prices - \$/MWh



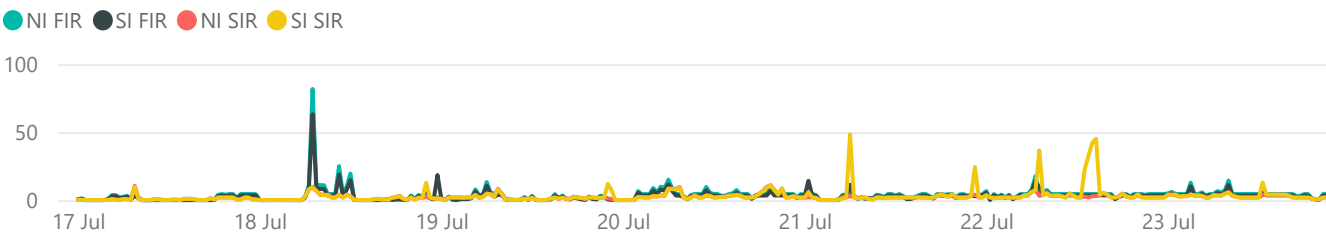
Generation - MW



Net HVDC Transfer - MW



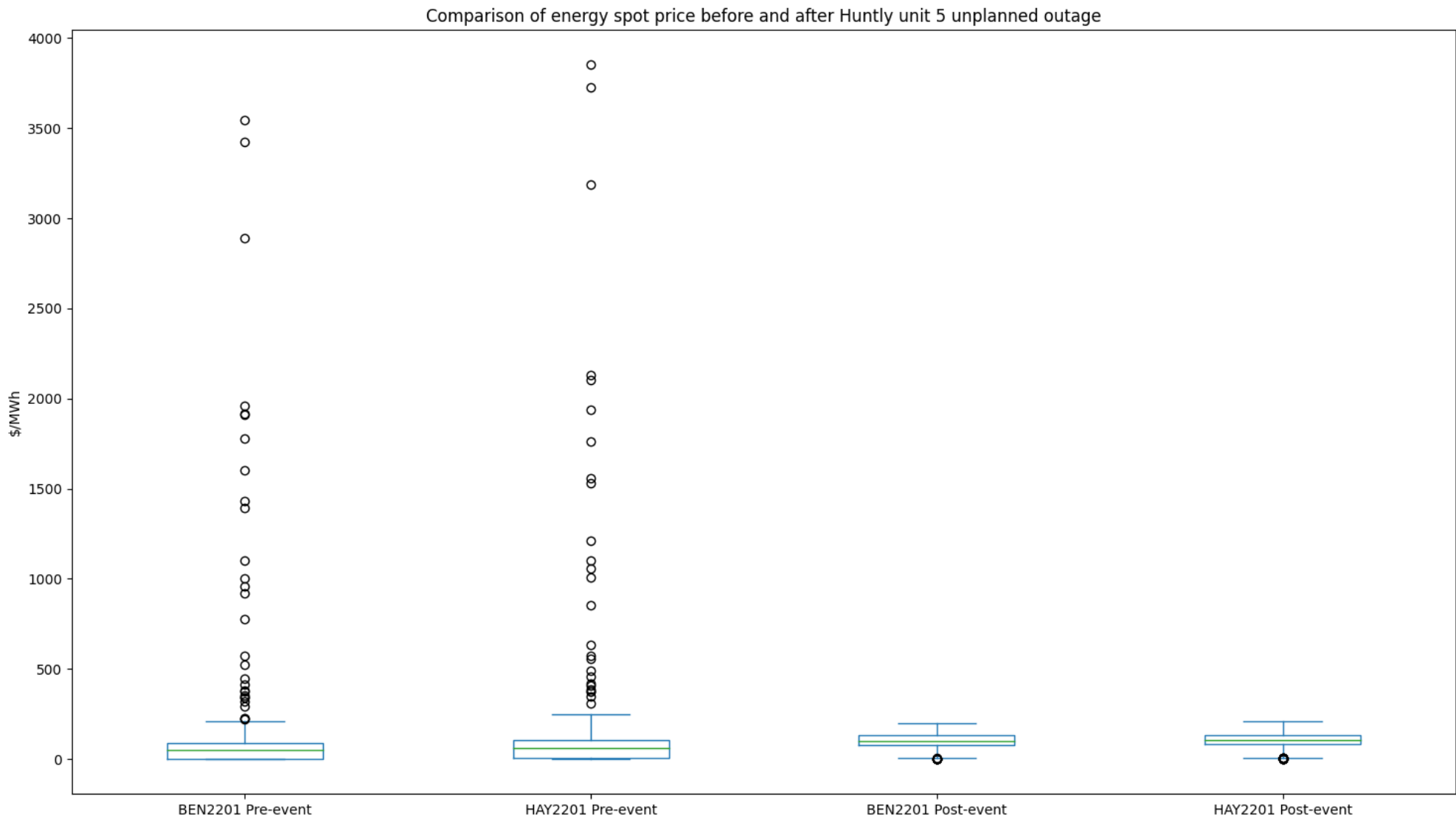
Reserve Prices - \$/MWh



Weekly Summary Insight - Reduced price volatility due to increased thermal commitment

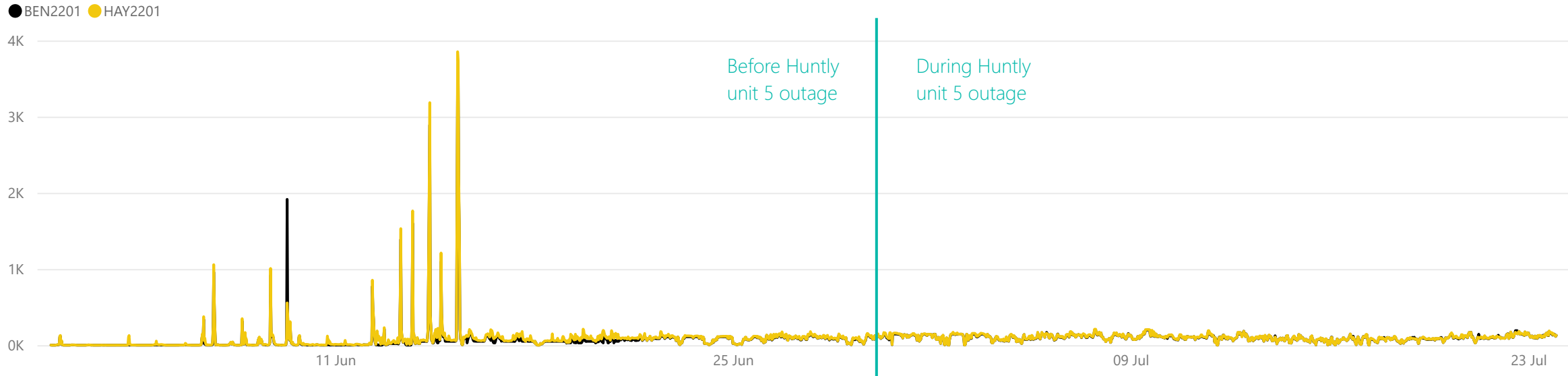
On Friday 30 June, Huntly unit 5 tripped at around 1:40 am and was removed from service. It is now expected to remain out of service until the end of August. In last week's Market Insight, we discussed the increase in committed thermal capacity and the resulting increase in residual generation margins that followed the removal of Huntly unit 5 from the system.

In the time since the outage began we have also seen a small increase in average prices and a reduction in price volatility, relative to the previous month.



Average prices have been higher and price volatility has been lower since the Huntly unit 5 outage began. "Pre-event" refers to the period from 1 June to 30 June and "Post-event" refers to the period from 30 June to 23 July

Energy price at Haywards and Benmore (\$/MWh) - June and July 2023



One reason for this reduction in price volatility is the increase in thermal committed capacity that we discussed last week. This is the total amount of thermal generation that is offered into the market. Slow-start thermal generators (which comprise over half of New Zealand's total thermal generation capacity) require several hours to start up. This means that if they are not already running, they cannot be used to respond to higher than expected demand, lower than expected wind generation or unexpected outages.

Reduced flexibility in the market when thermal committed capacity is low leads to higher price spikes and increases the risk of demand exceeding the available generation capacity.

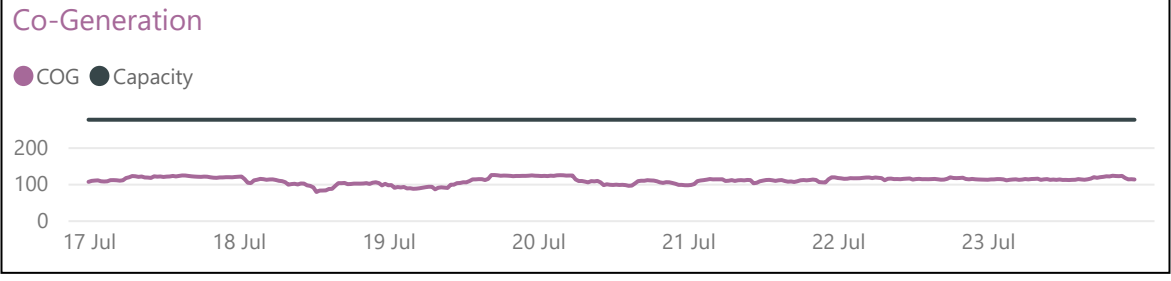
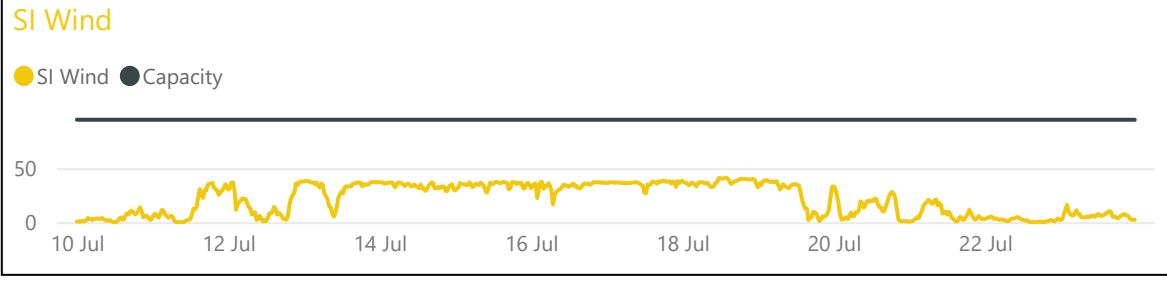
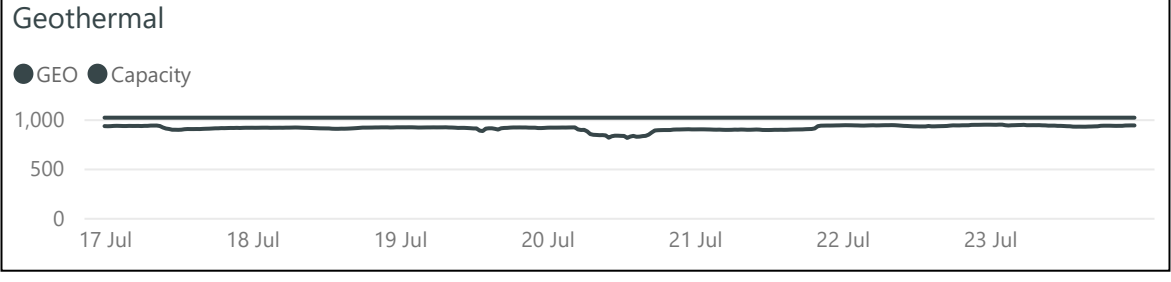
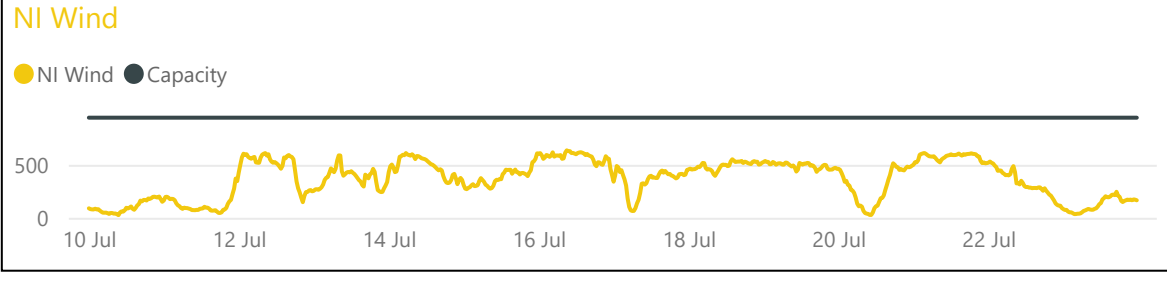
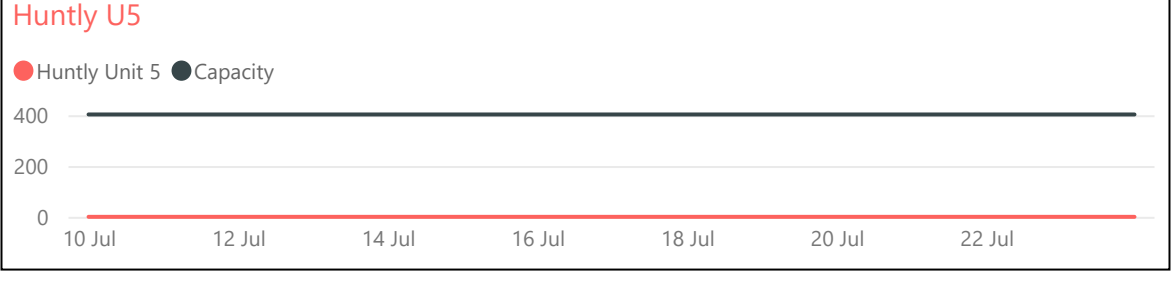
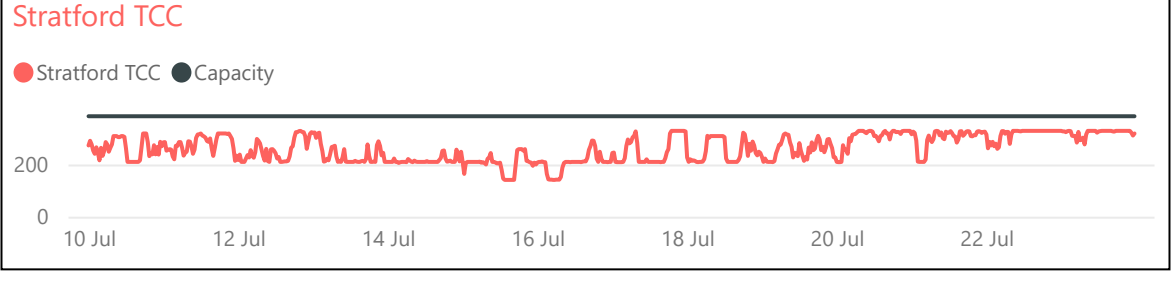
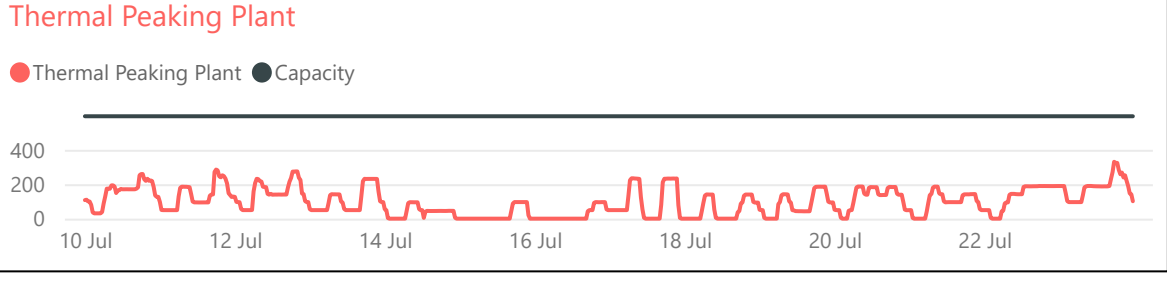
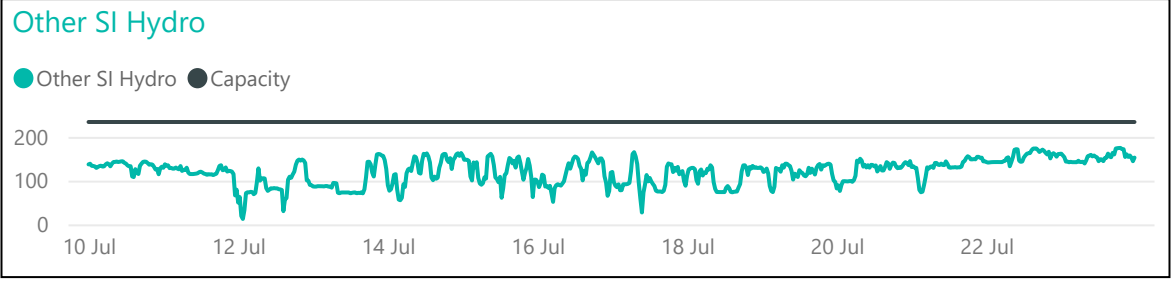
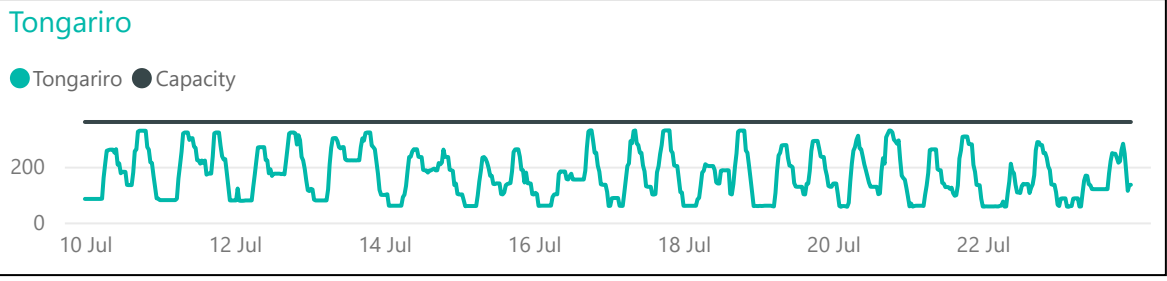
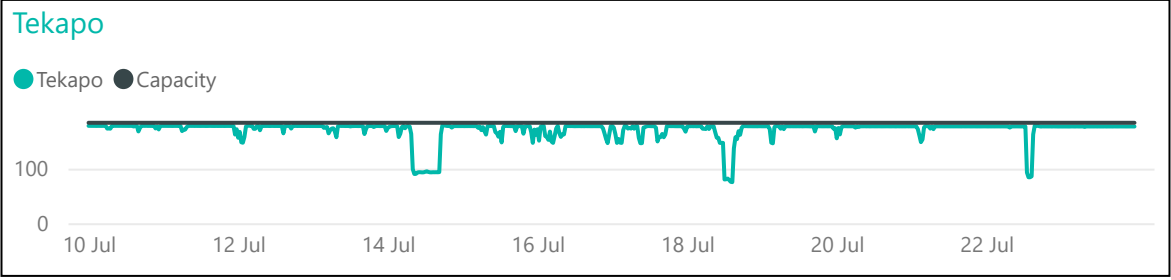
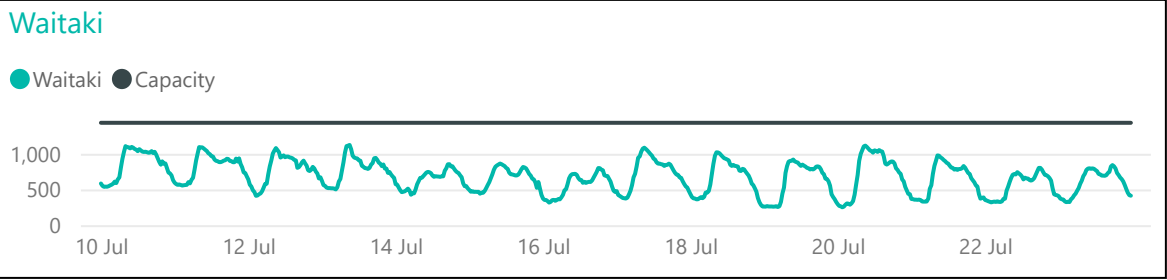
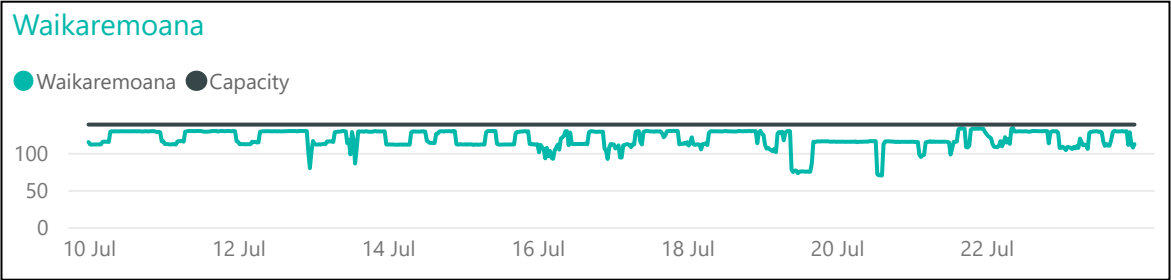
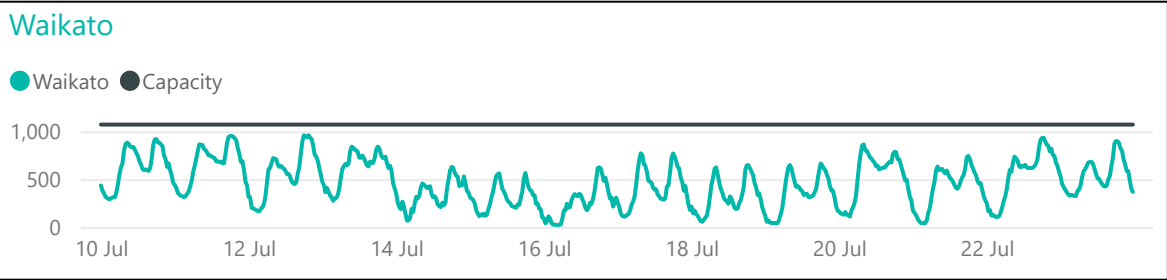
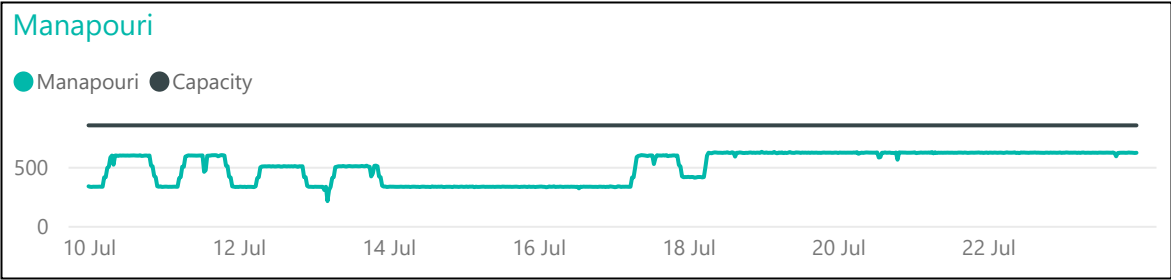
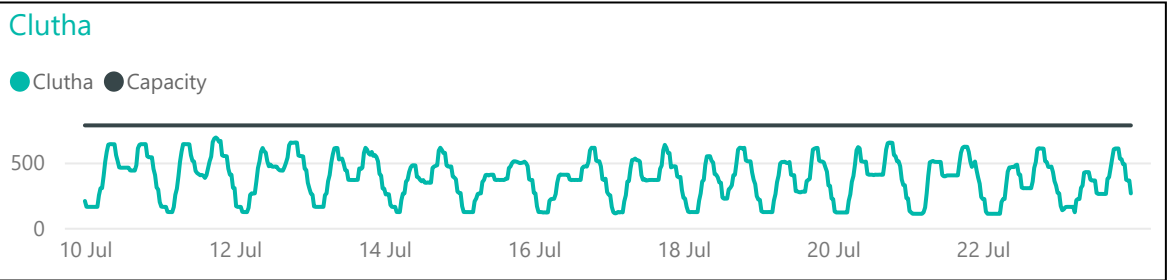
Causes of the increase in thermal committed capacity include:

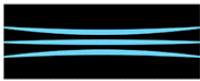
- Reduced hydro storage: While hydro storage remains high at 118% of the historic mean, this is a reduction from early June when storage exceeded the nominal full value. High hydro storage results in lower prices and reduces the incentive for slow-start thermal generators to operate, reducing thermal committed capacity.
- The Huntly unit 5 outage: Thermal committed capacity has increased following the Huntly Unit 5 outage. Both the Taranaki Combined Cycle plant and a third Rankine unit at Huntly have been running. Between them these are capable of generating over 600 MW, which exceeds the 385 MW capacity of Huntly unit 5.

As the system becomes more renewable, we can expect more price volatility, signaling the need for more flexible technologies such as battery storage, demand response and gas peaking generation.

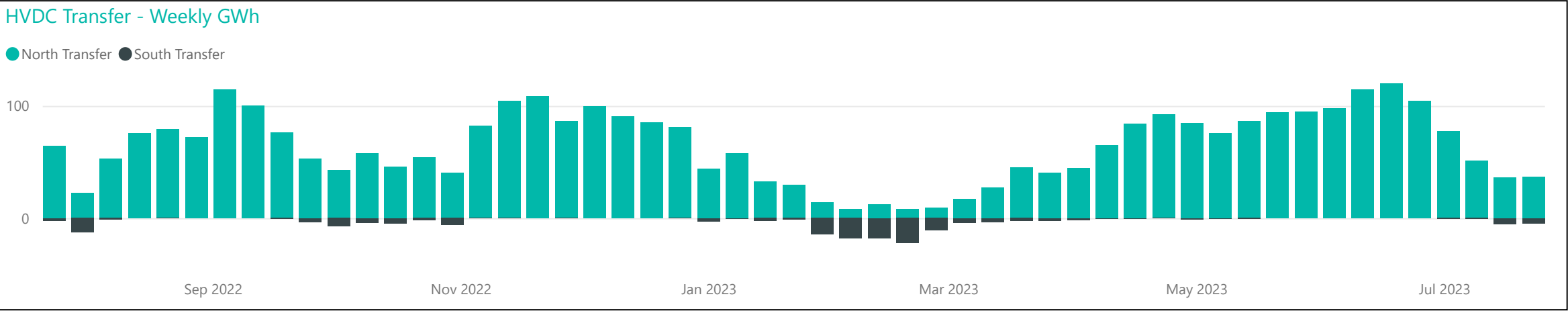
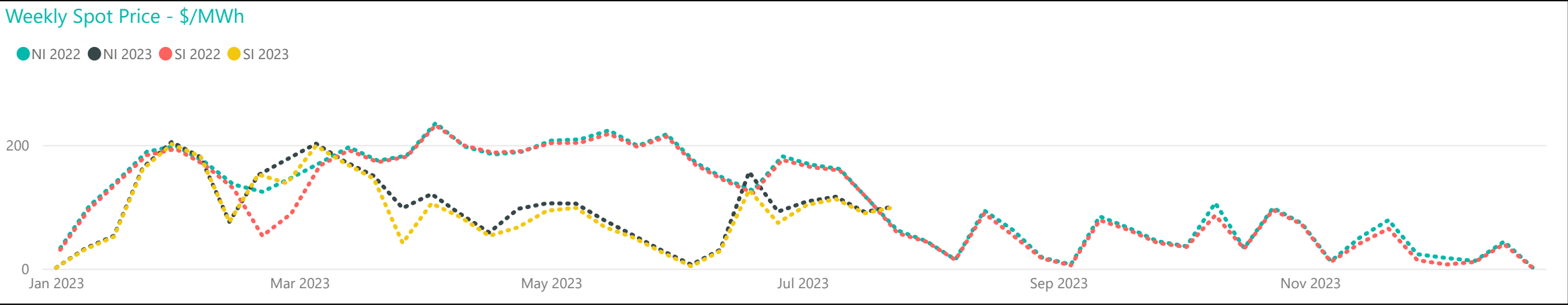
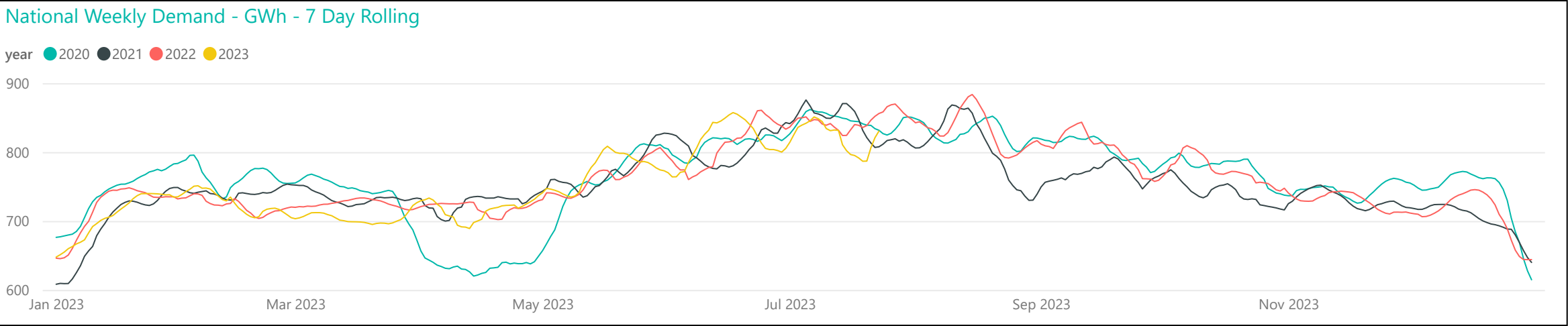


Generation Breakdown - Last Two Weeks *Measured in MW and displayed at trading period level for last 14 days*

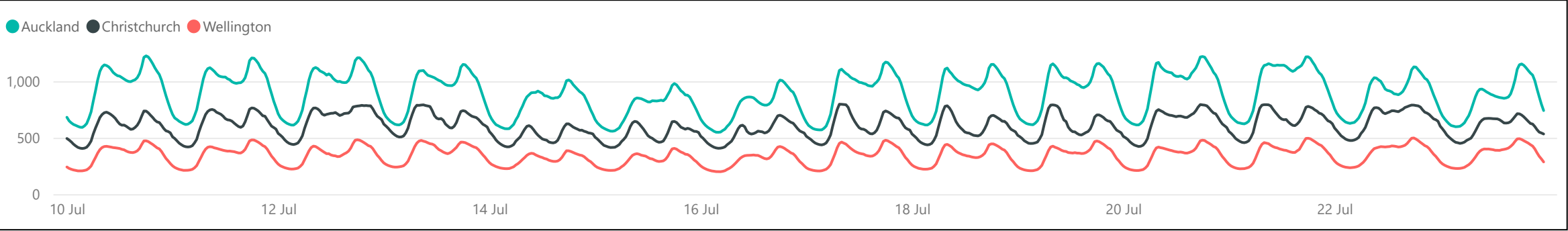




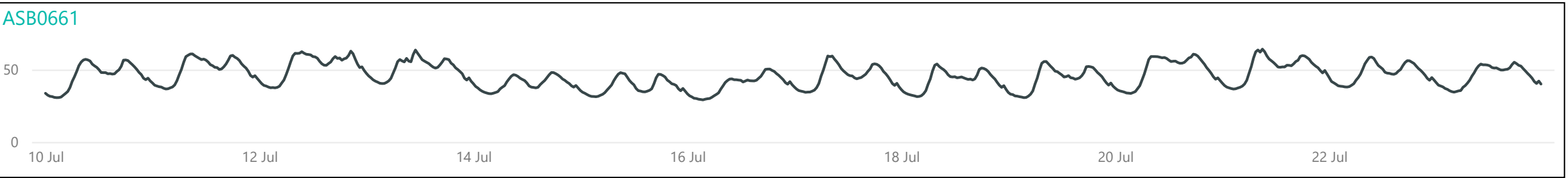
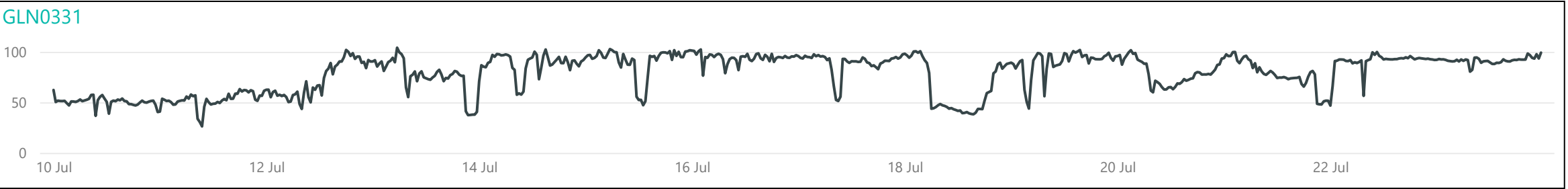
Weekly Profiles



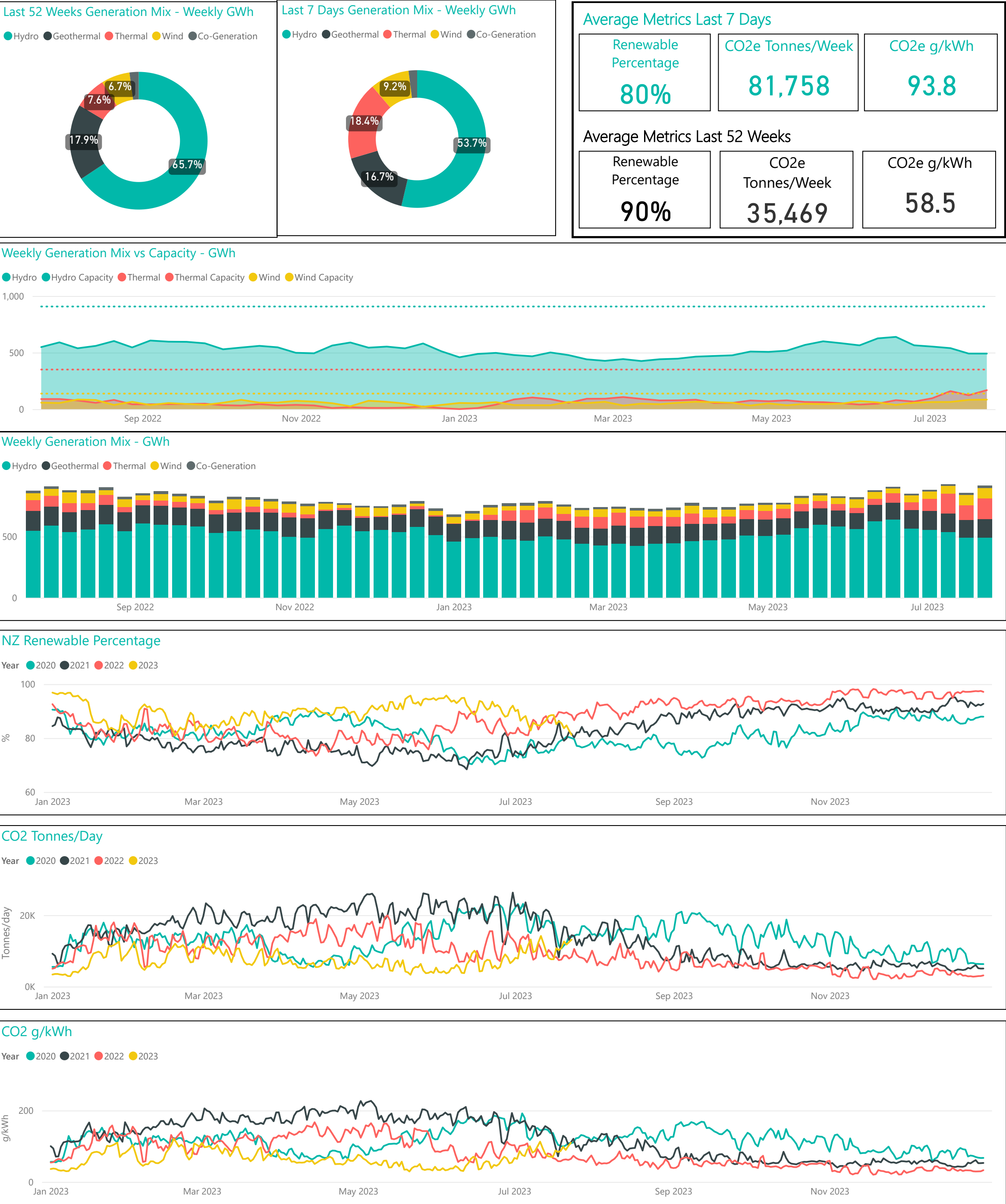
Conforming Load Profiles - Last Two Weeks *Measured in MW shown by region*

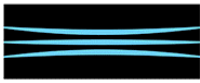


Non-Conforming Load Profiles - Last Two Weeks *Measured in MW shown by GXP*

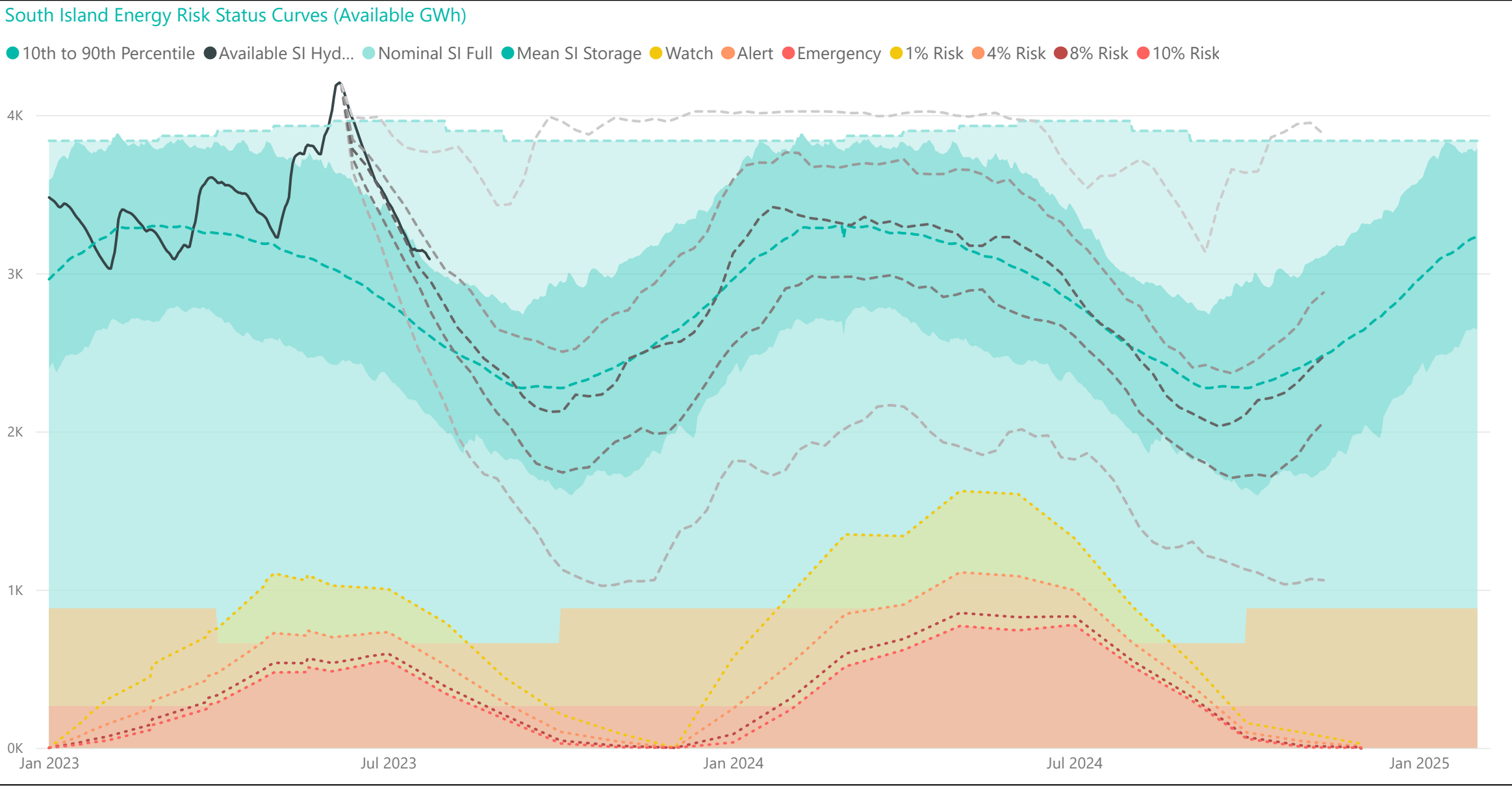
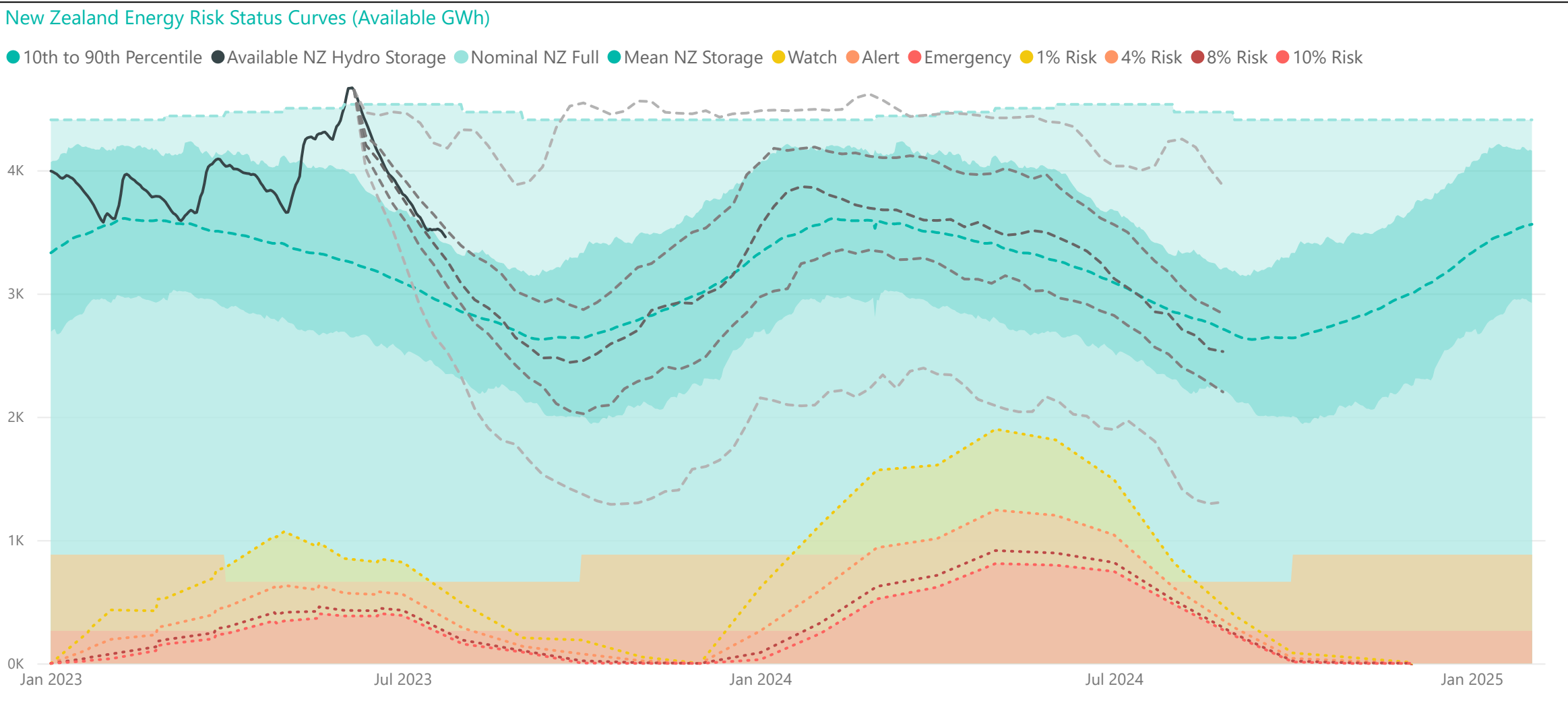


Generation Mix





Energy Risk Curves

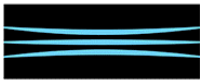


Electricity Risk Curve Explanation:

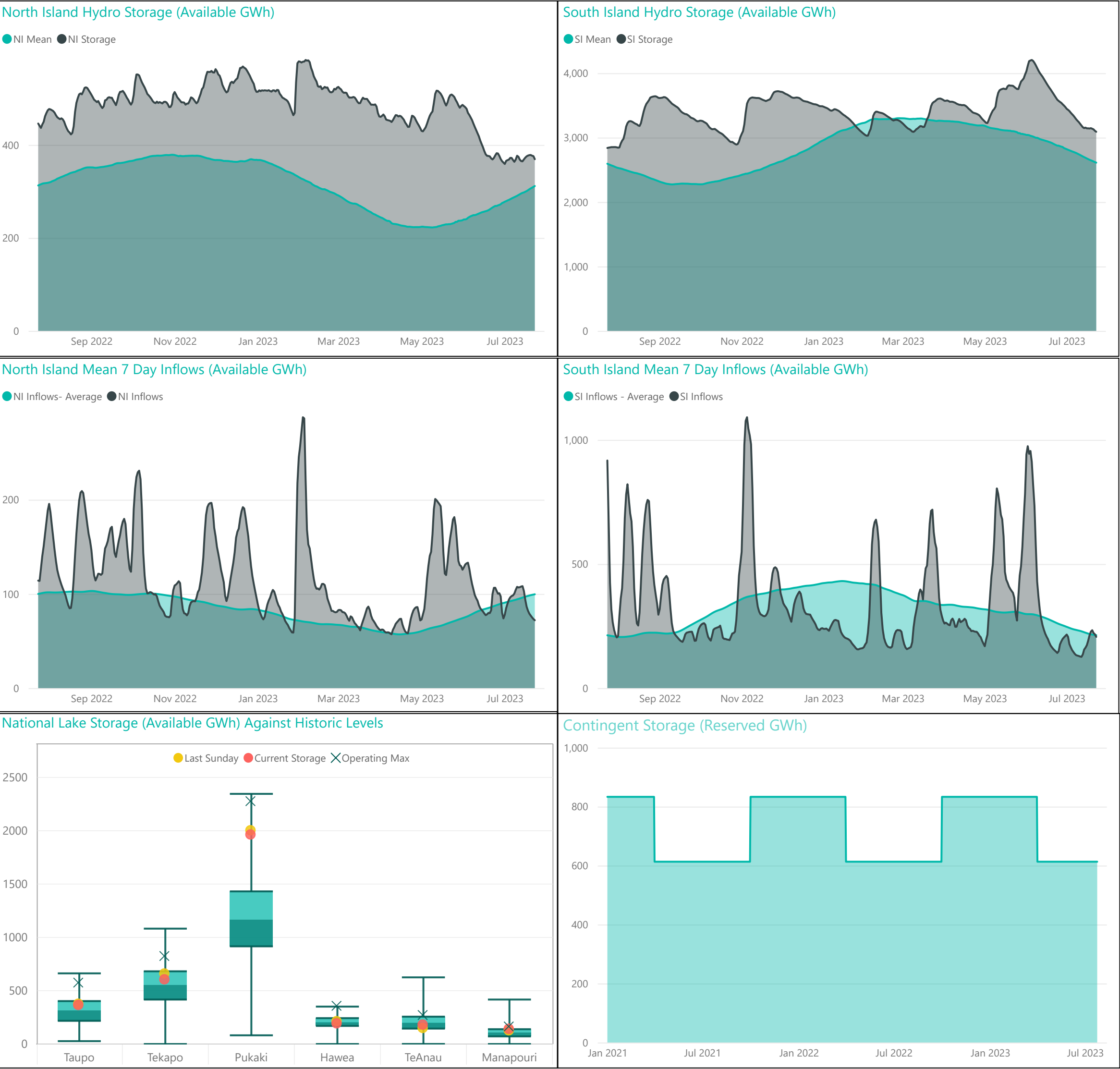
- Watch Curve - The maximum of the one percent risk curve and the floor and buffer
- Alert Curve - The maximum of the four percent risk curve and the floor and buffer
- Emergency Curve - The maximum of the 10 percent risk curve and the floor and buffer
- Official Conservation Campaign Start - The Emergency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



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>