



Weekly Market Movements - Week Ended 10 December 2023

Overview

National hydro storage continued to decline last week and remains below average for the time of year. Residual generation margins remained healthy last week and looking ahead N-1-G margins are healthy for the rest of December.

In this week's insight we take a look at the year to date; the highs and lows of peak demand, prices, and generation contributions by fuel type.

Security of Supply

National hydro storage continued to decline last week, dropping from 93% the week prior to 91% of the average for this time of year. South Island storage decreased to 88% of its historical mean, while North Island storage decreased to 111%.

Capacity

Residual generation margins were healthy last week, with a minimum residual of 497 MW on Wednesday morning. The Wednesday morning peak also saw the lowest wind generation of all peak periods last week.

N-1-G Margins are healthy for the remainder of December and through January. The latest NZGB report is available on the [NZGB website](#).

Electricity Market Commentary

Weekly Demand

National demand increased last week from the week prior to 744 GWh. Demand peaked at 5,285 MW on Tuesday 5 December at 8:00 am.

Weekly Prices

The average wholesale price increased at Haywards last week to \$149/MWh, from \$141/MWh the previous week. Prices peaked at \$426/MWh at Otahuhu on Thursday 7 December at 1:00pm which bumped up average prices.

Generation Mix

The generation mix last week remained similar to the week prior, with the renewable percentage of the generation mix at 89%. Both wind and hydro generation contribution remained at 9% and 61% respectively, while the remaining generation types experienced little or no change also.

On 7 December wind generation surpassed thermal generation as a percentage of the generation mix, providing over 800 MW of generation in all trading periods overnight and a maximum of 883 MW at 10:30pm.

The commissioning of the Rotohiko battery was completed on Monday and the associated ECE commissioning risk was removed from the electricity market. Kaitiaki Solar and Harapaki Wind Farm remain in commissioning, with associated ECE commissioning risks still in effect.

HVDC

Net HVDC flows were predominantly northward last week with the exception of overnight on Thursday 7 December and Sunday 10 December, as well as for a few periods on 5 December, all coinciding with high North Island wind generation and low demand.

SOSA Consultation

The 2024 Security of Supply Assessment (SOSA) Reference Case and Sensitivities Consultation closed 5 December. We have received four responses which will be published to the Transpower website [here](#).

New Zealand Energy Risk

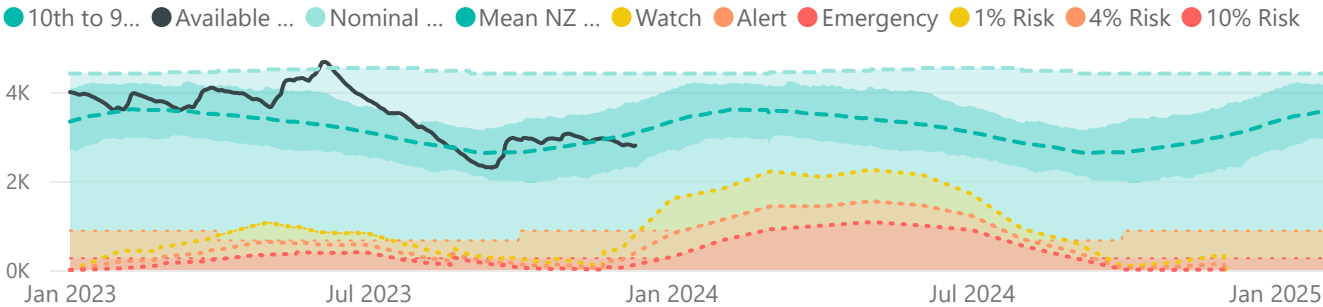


South Island Energy Risk

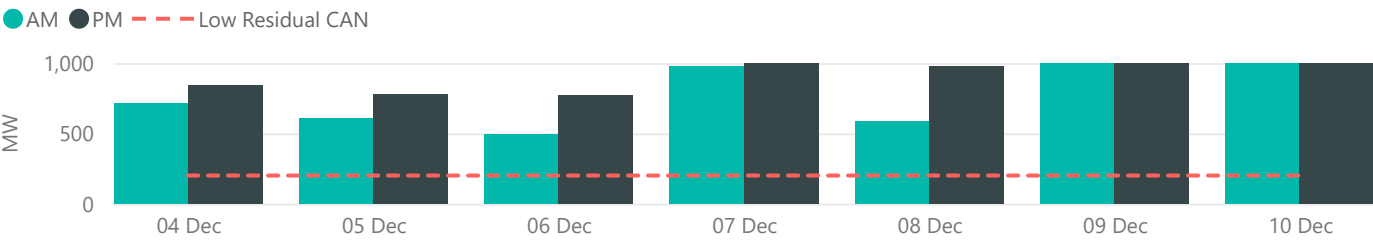


Normal Watch Alert Emergency

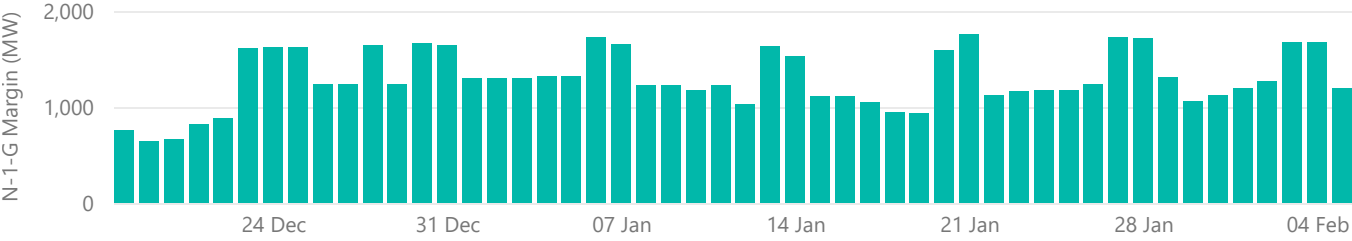
New Zealand Energy Risk Status Curves (Available GWh)



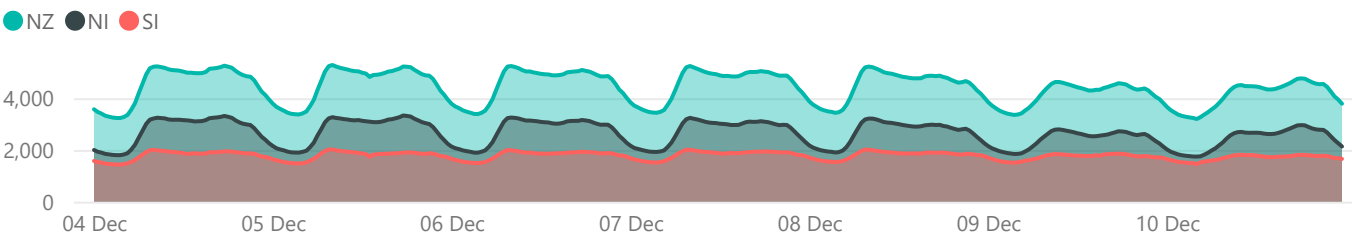
Lowest Residual Points - MW



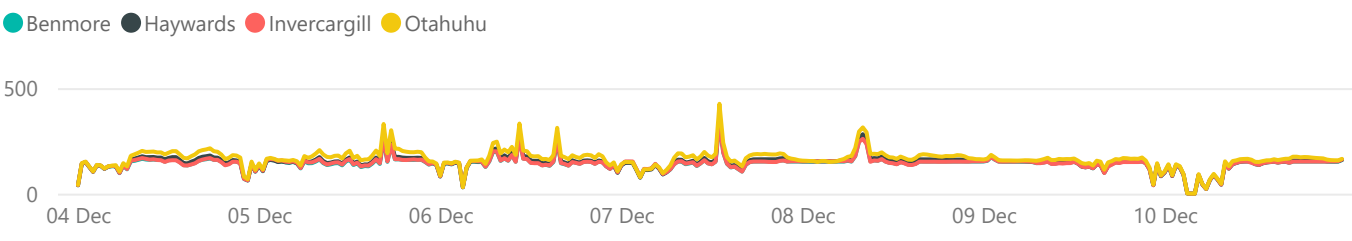
NZGB Look-Ahead (excluding next 7 days)



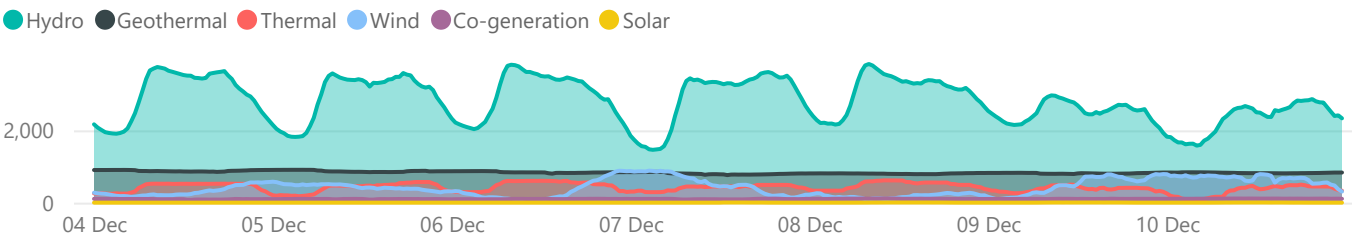
National Demand by Trading period - MW



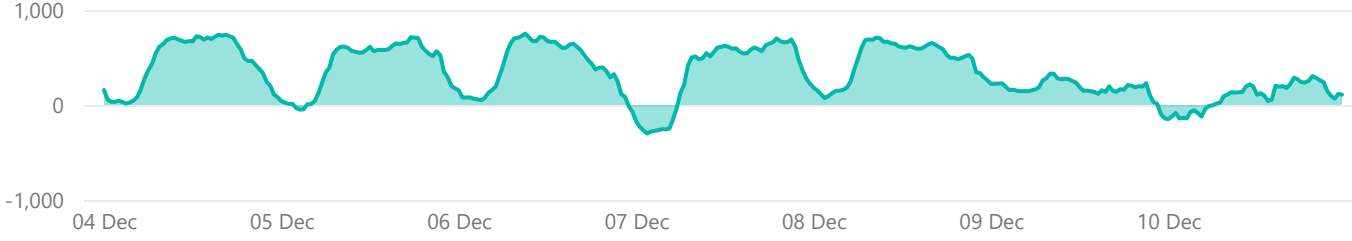
Weekly Prices - \$/MWh



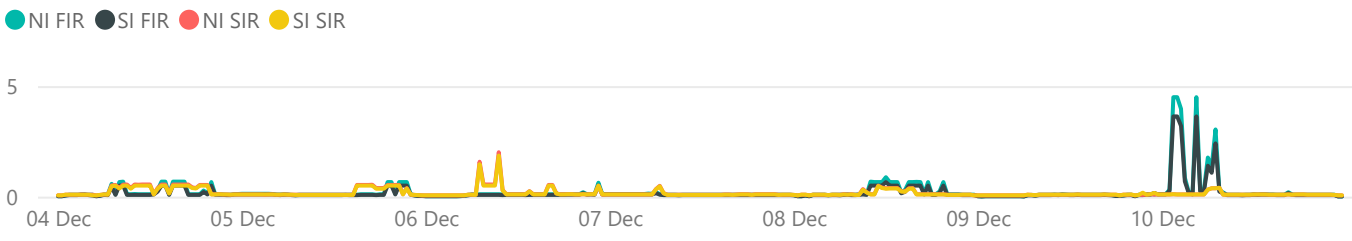
Generation - MW

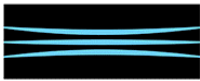


Net HVDC Transfer - MW



Reserve Prices - \$/MWh

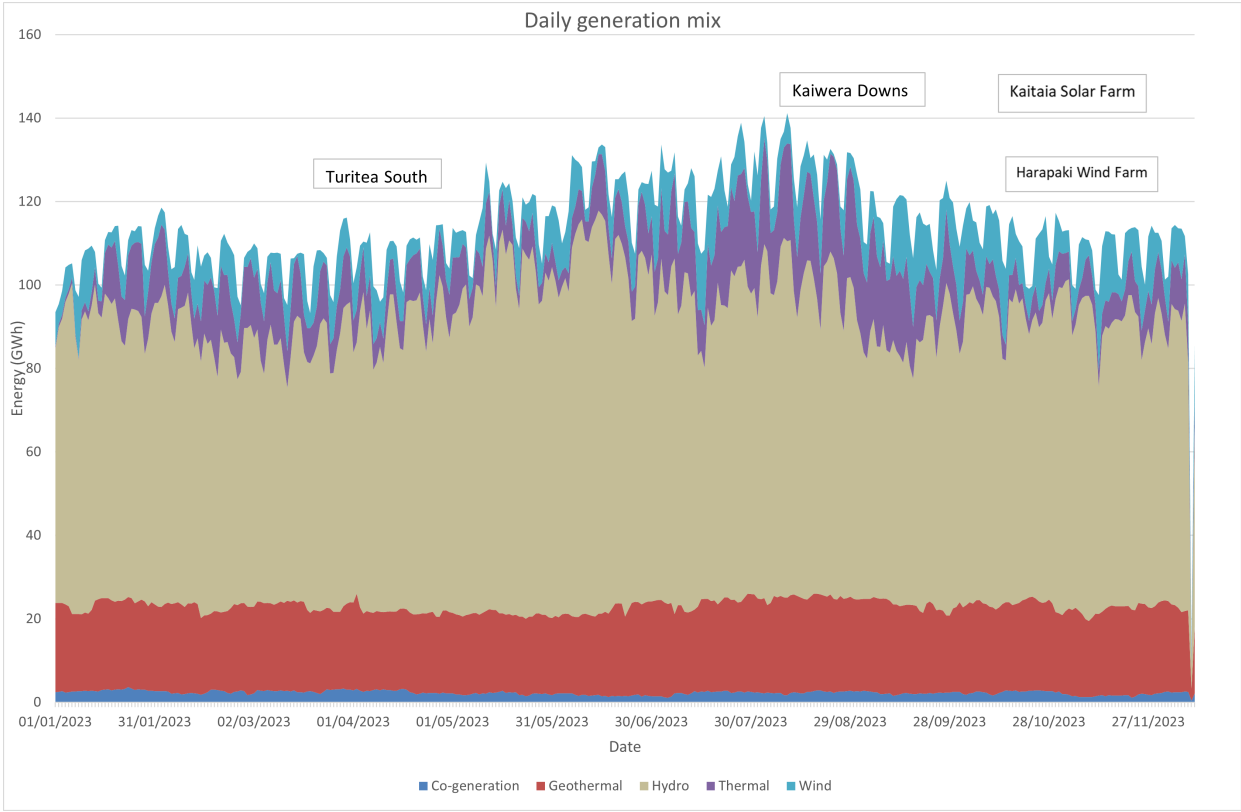




Weekly Summary Insight - Year in Review

There has been plenty of activity this year in our System Operator role, with five new generators commissioned or commissioning in the market system.

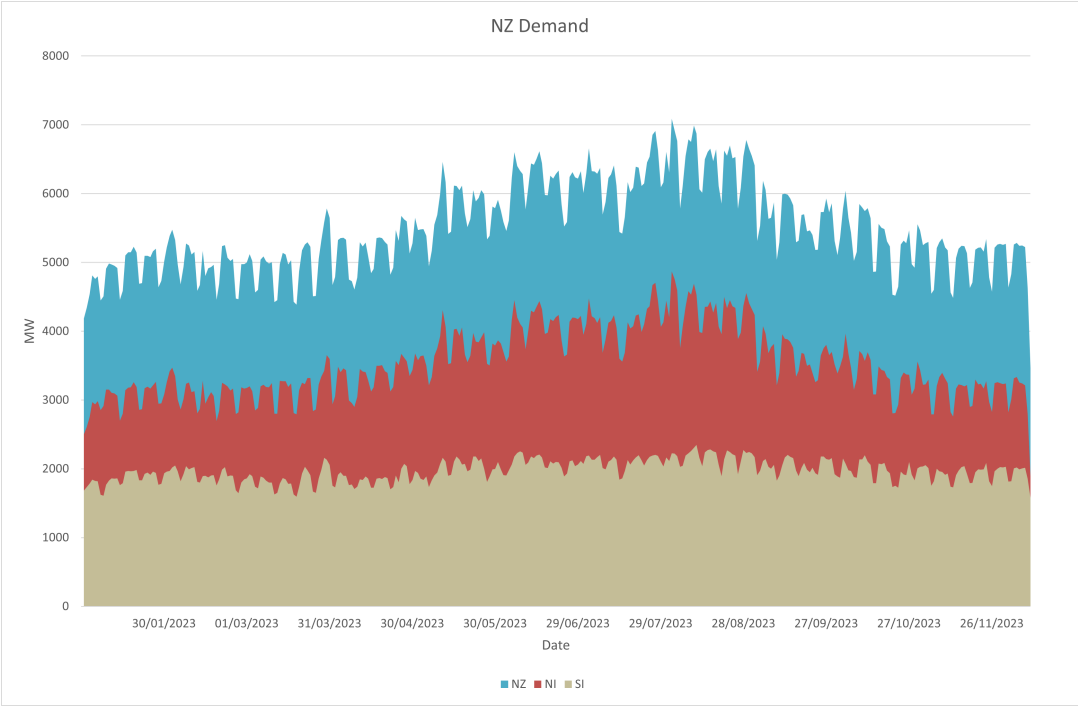
Kaiwera Downs and Turitea South finished commissioning this year and are offering energy into the market. Harapaki Wind Farm has begun generating and commissioning. When fully commissioned, these three wind farms will have a combined capacity of 322 MW. We also saw two big milestones this year; the first utility scale solar farm, Kaitaia Solar Farm began generation in November and is currently commissioning, as well as the first utility scale battery energy storage system, Rotohiko battery, having completed commissioning.



Generator	Capacity (MW) ¹	Fuel Type
Turitea South ²	103	Wind
Kaitaia Solar Farm	23	Solar
Harapaki	176	Wind
Kaiwera Downs	43	Wind
Rotohiko Battery	33	Battery

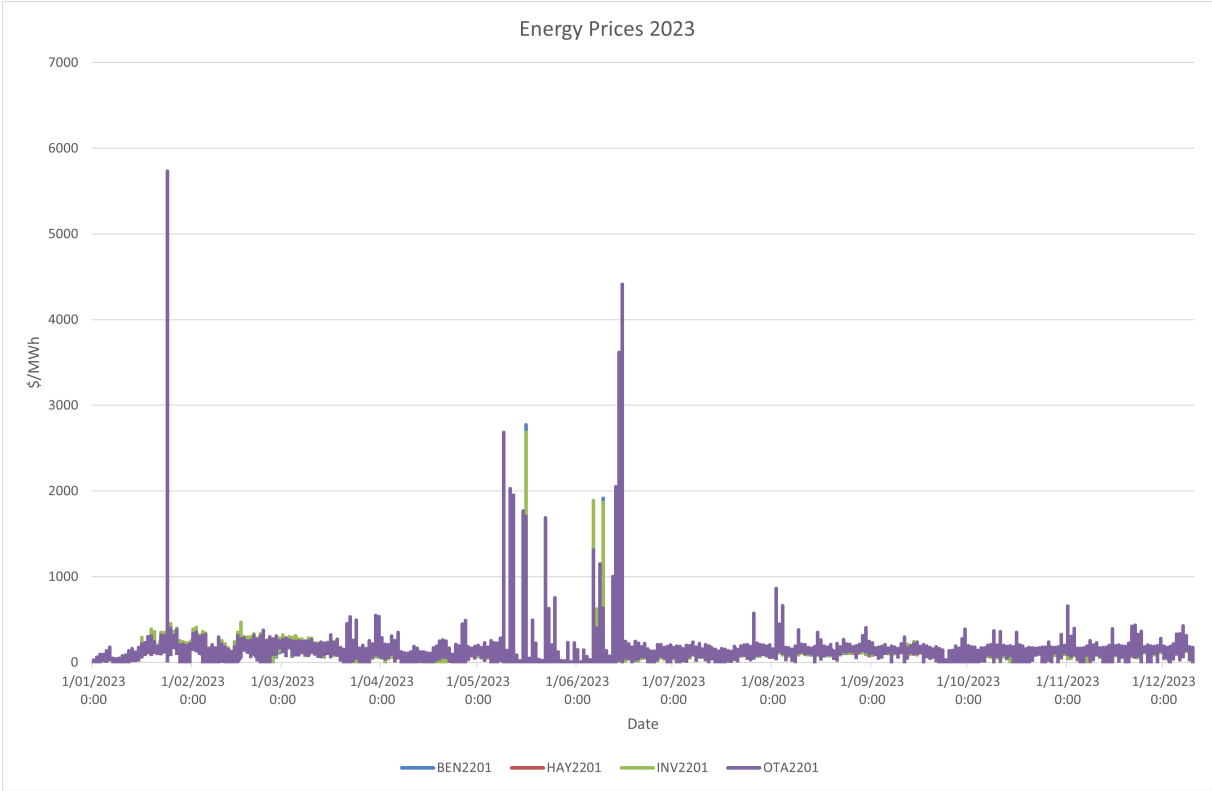
Average daily percentage contribution				
Co-generation	Geothermal	Hydro	Thermal	Wind
2.28	20.66	71.32	10.95	8.55

Hydro generation continued to contribute the largest percentage to the overall generation mix in 2023. Baseload geothermal and cogeneration was relatively consistent over the year. Thermal generation contribution increased in the winter months between July and September. Wind generation also increased before winter with the commissioning of Turitea South in March-April and then again in August-November with the commissioning of Kaiwera Downs. These added a further 146 MW of potential wind generation.



Maximum daily peak demand increased in both islands during the winter months with the maximum peak for the year of 7,088 MW at 6:00pm on 2 August. This was the second highest peak on record.

Energy prices (\$/MWh)				
GXP	BEN2201	HAY2201	INV2201	OTA2201
Average	107	115	111	125
Median	110	118	111	130
Minimum	0.00	0.01	0.00	0.01
Maximum	3543	3853	3471	5735



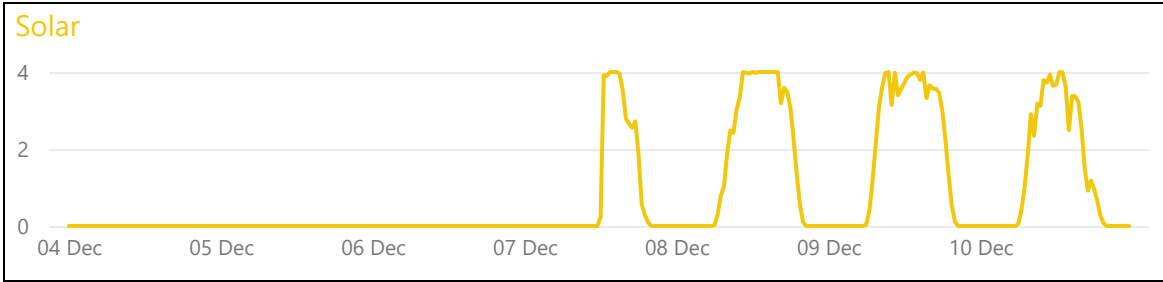
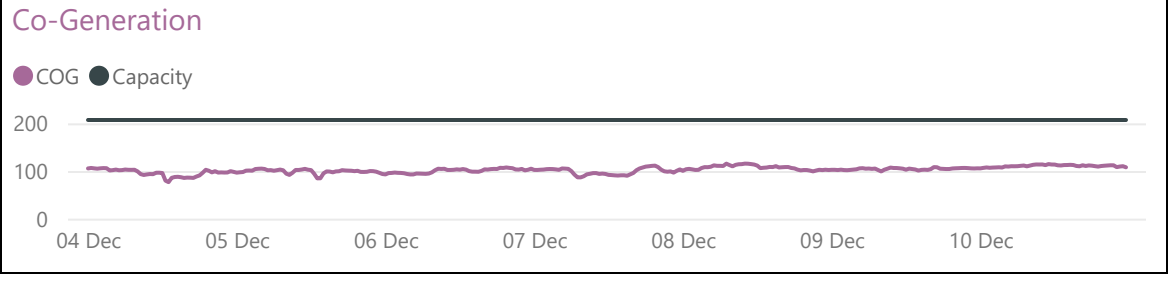
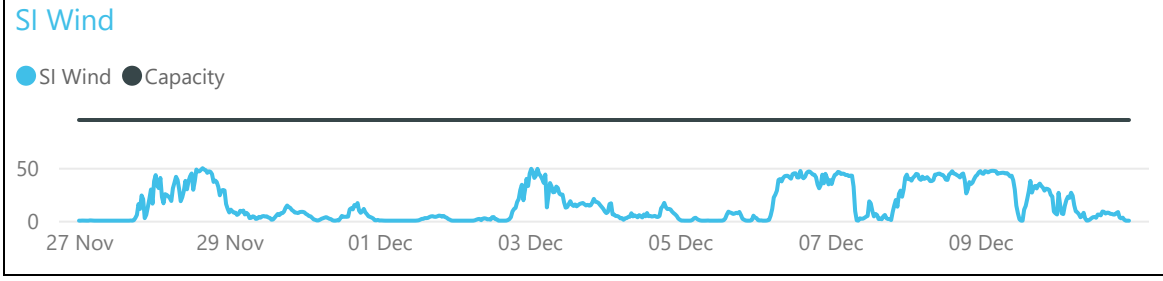
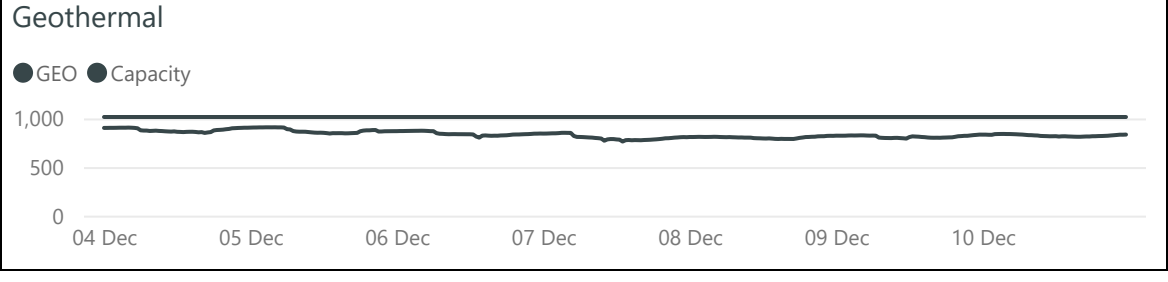
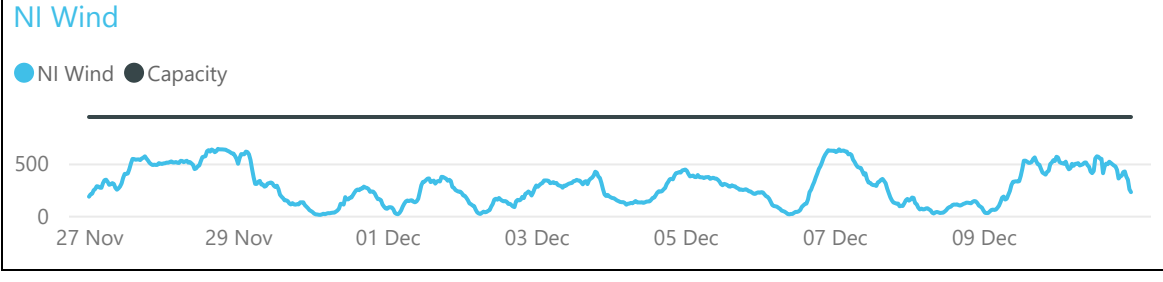
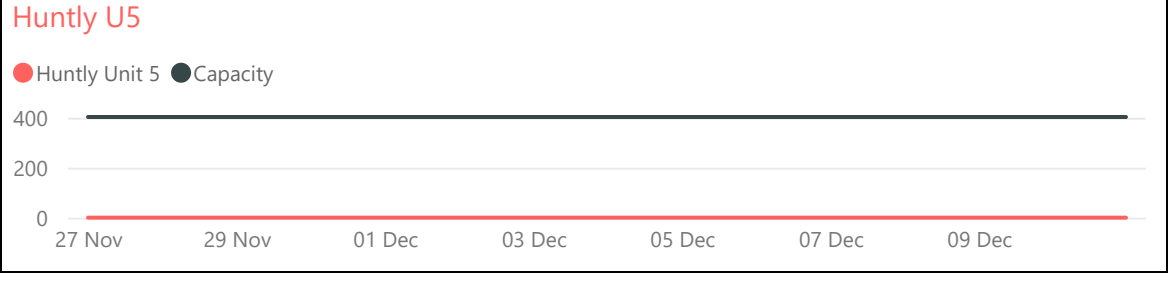
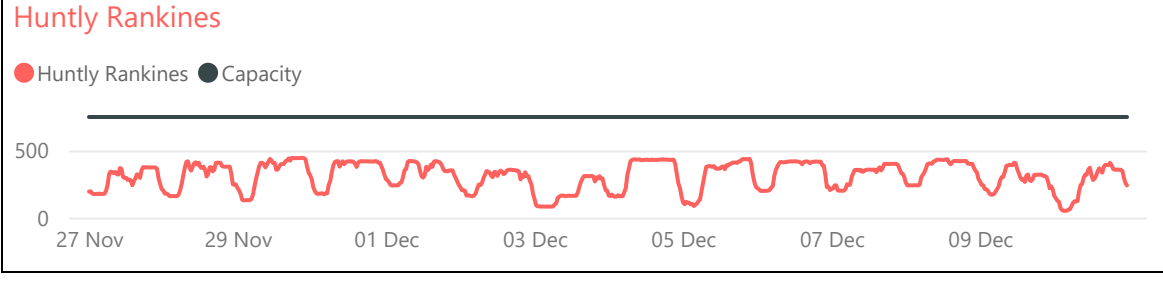
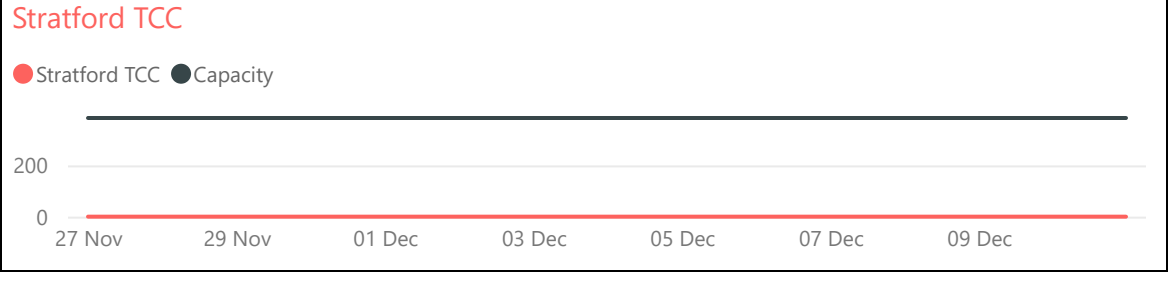
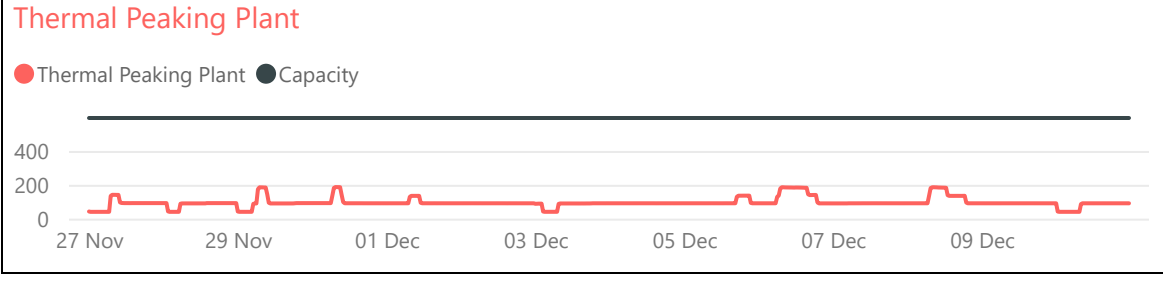
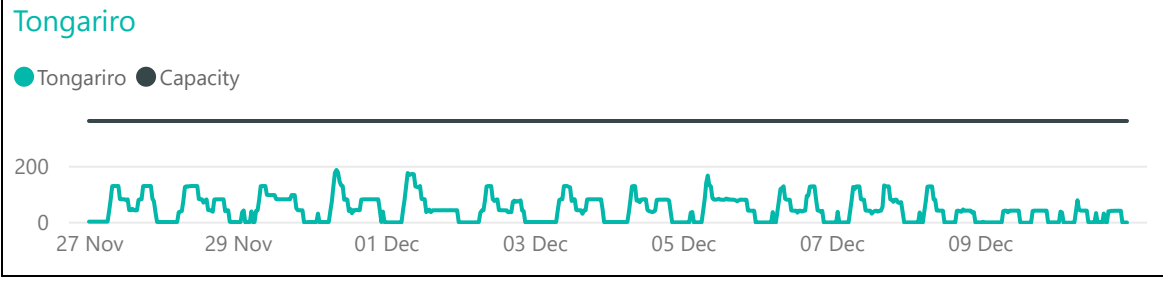
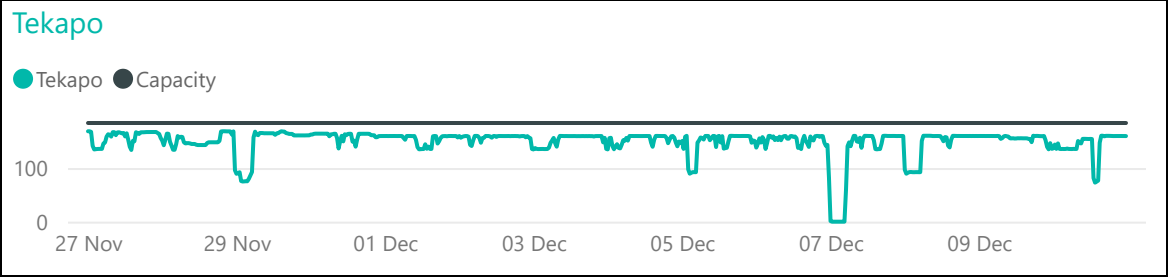
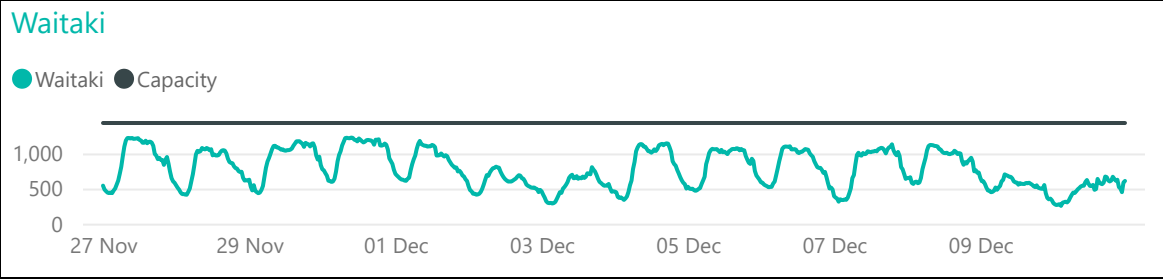
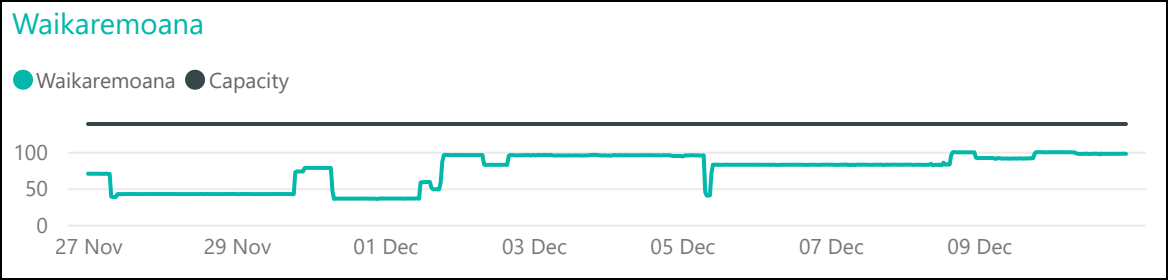
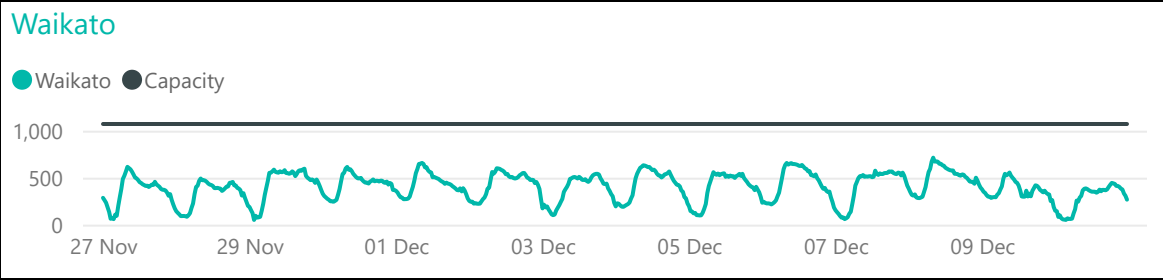
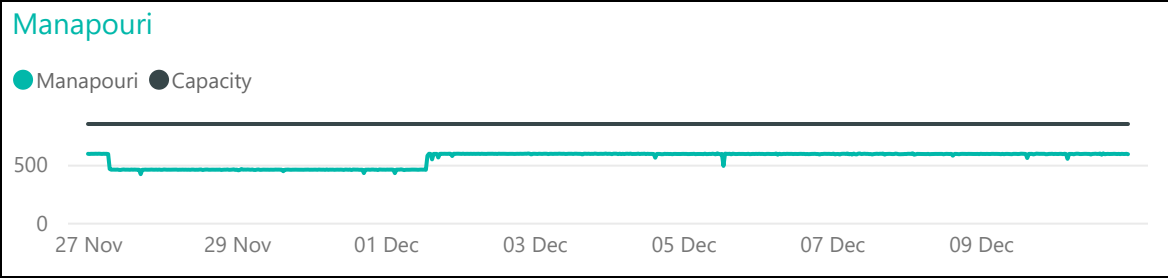
The average energy price in 2023 was just over \$110/MWh at HAY2201, with the highest price spike reaching over \$5,500/MWh at OTA2201 in January. This was due to a large thermal unit tripping which caused part of the grid to be constrained. Further price spikes were observed throughout the country in May and June, often during periods with low residuals. Reserve and energy scarcity prices were seen for the first time under real-time pricing on the morning of Tuesday 16 May, during a very cold morning in the South Island. This required a reduction in northward HVDC transfer which could not be met in time to prevent energy scarcity.

1 - This is the capacity when fully commissioned. Some generators are still commissioning and the total generation is less than this at present.
2- Turitea South and North Windfarms are offered collectively to the market. The combined total is 222MW.



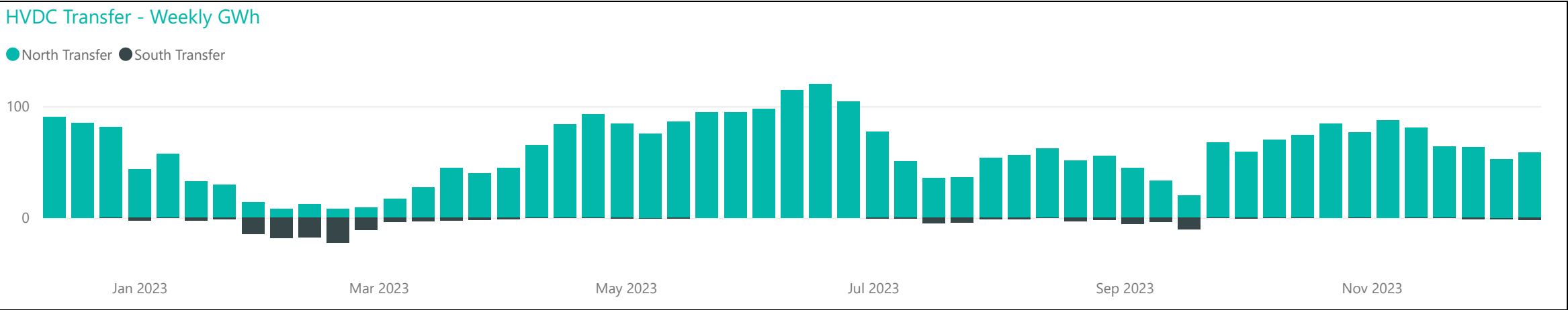
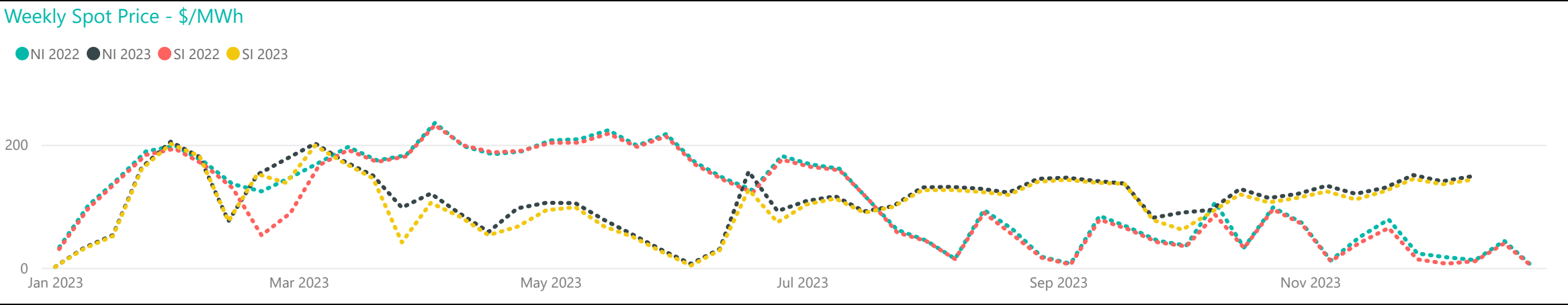
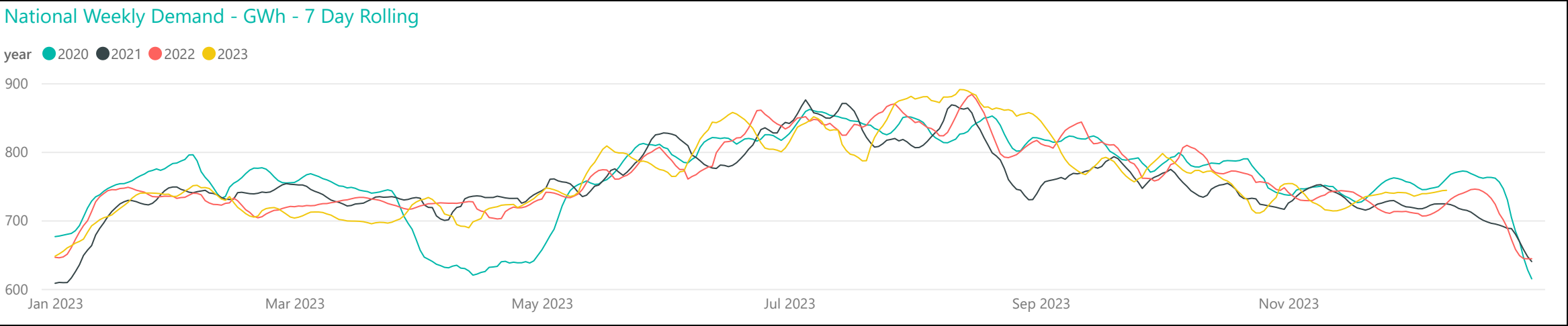
Generation Breakdown - Last Two Weeks

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

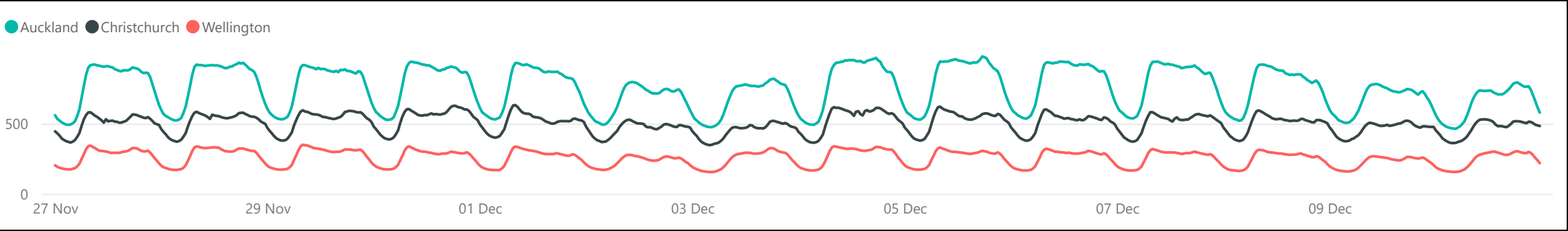




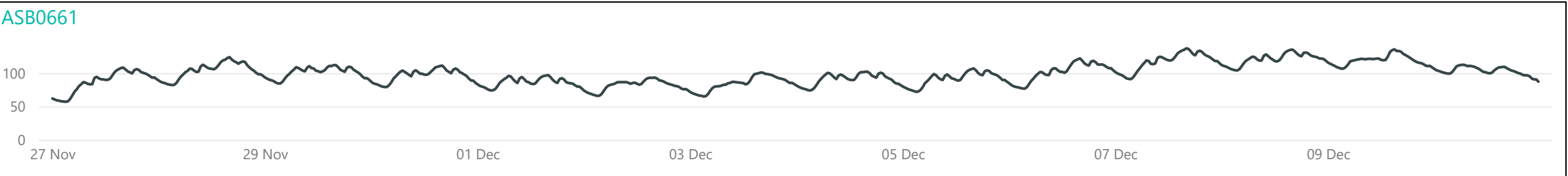
Weekly Profiles



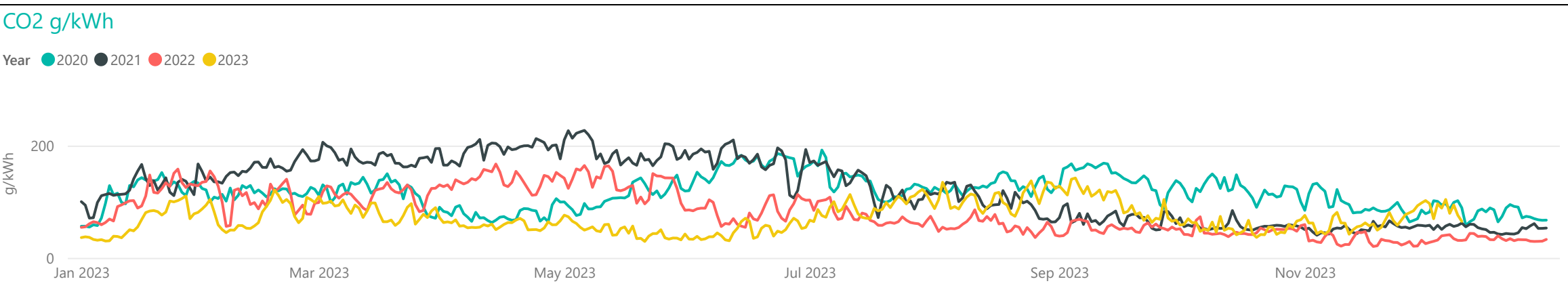
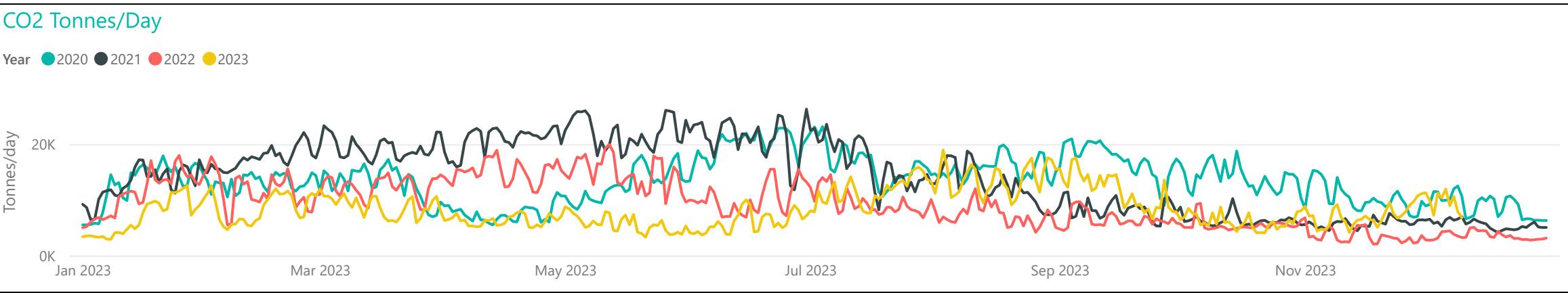
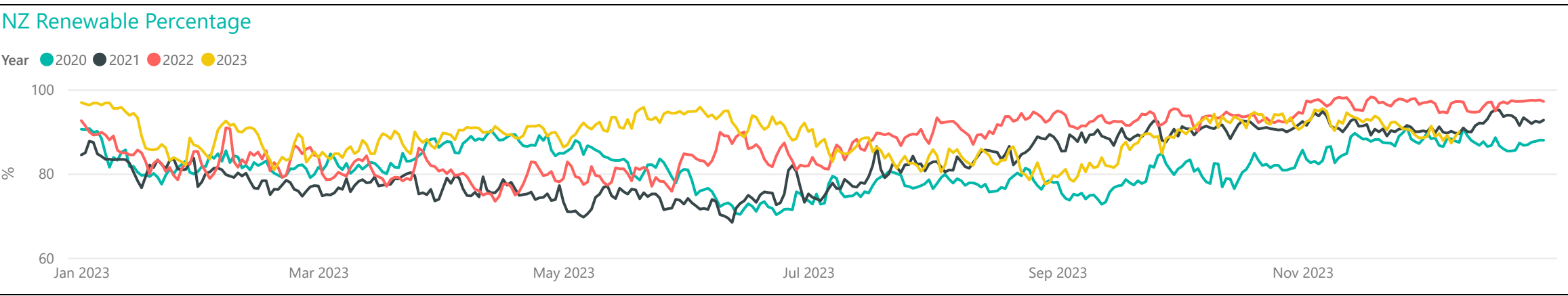
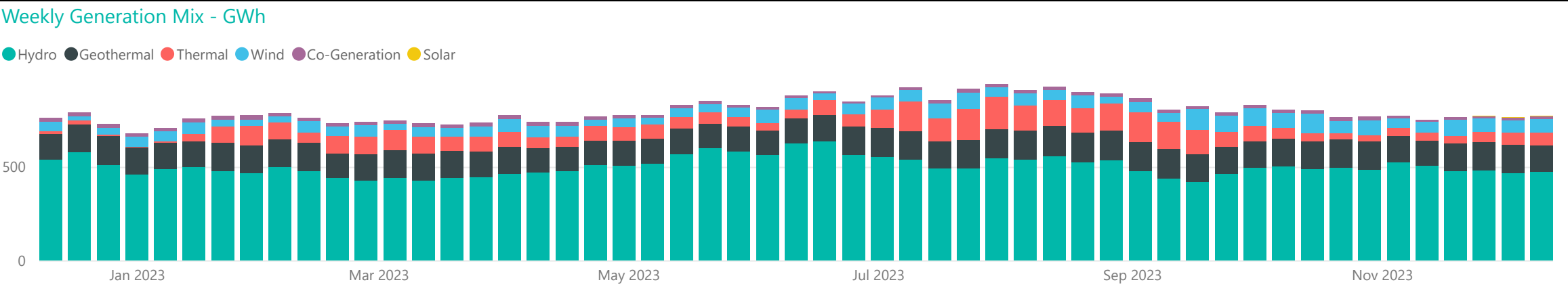
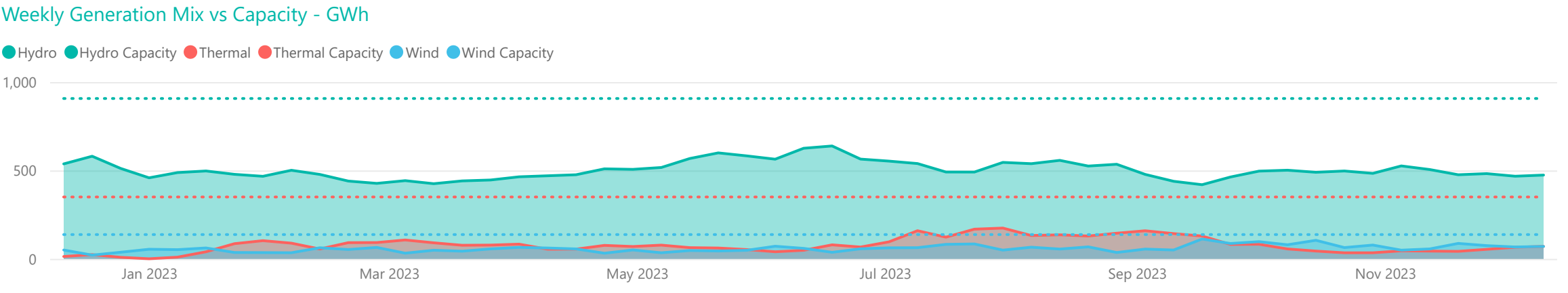
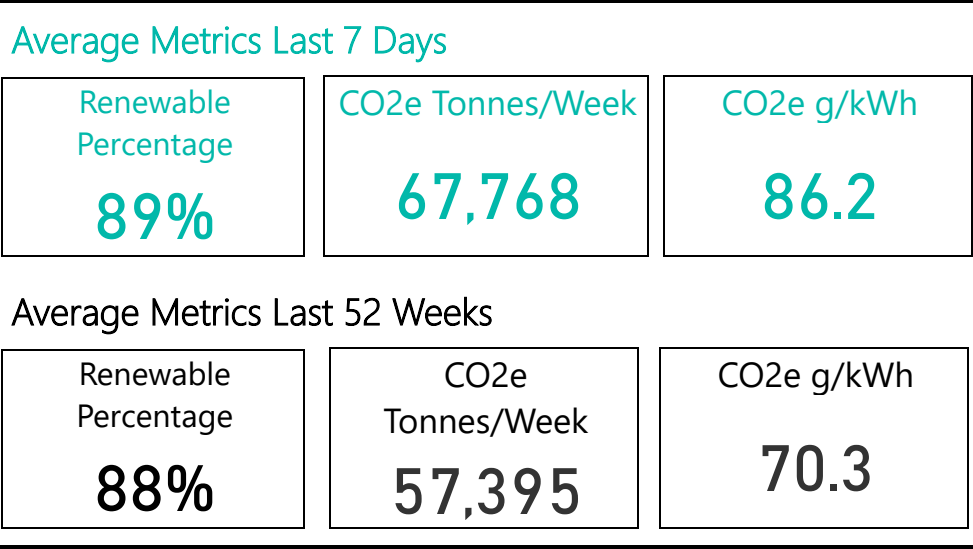
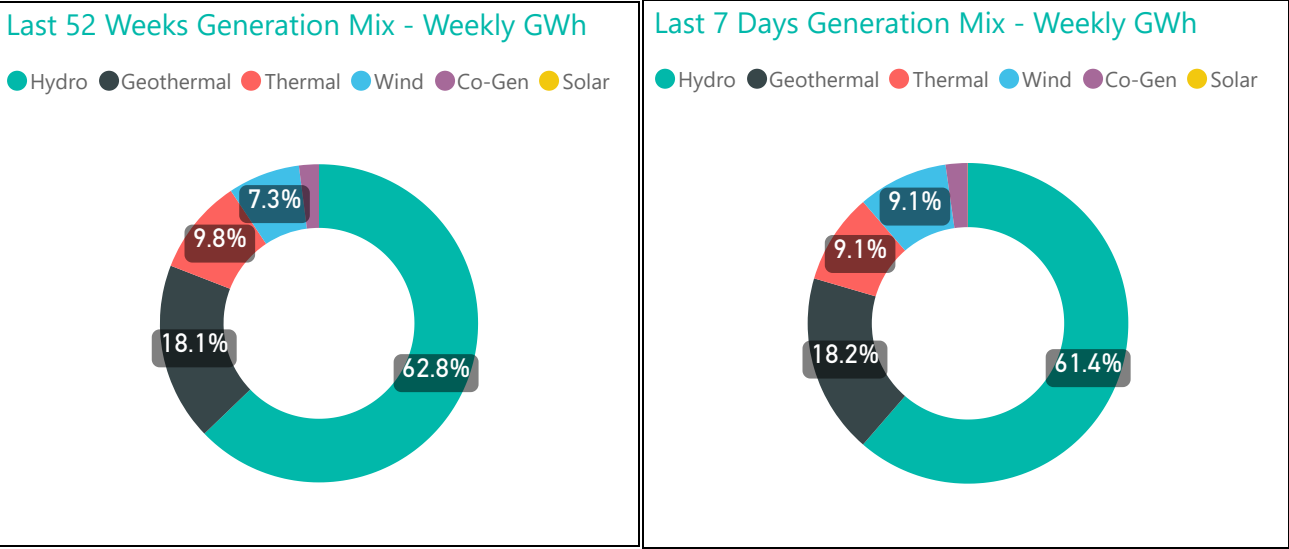
Conforming Load Profiles - Last Two Weeks *Measured in MW shown by region*



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

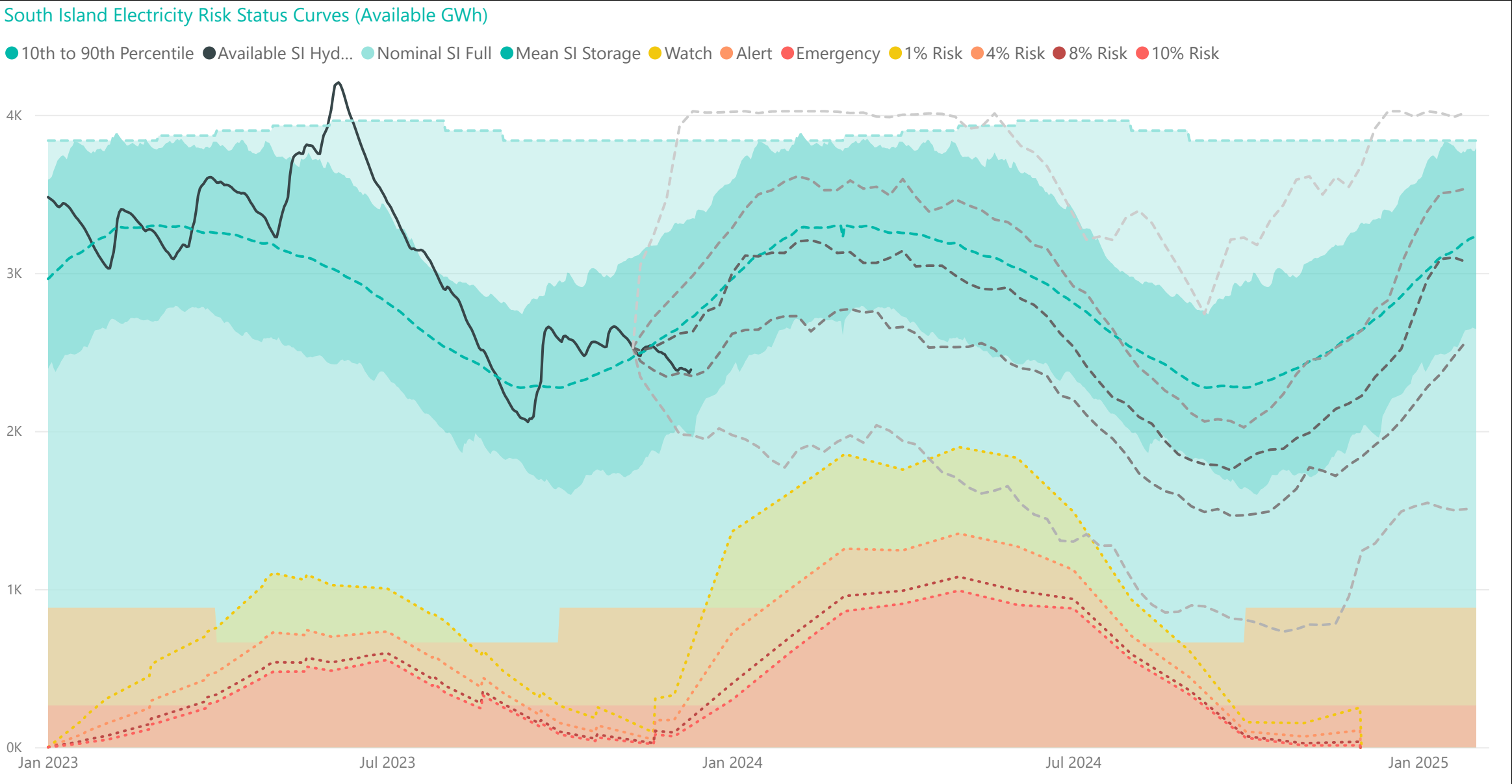
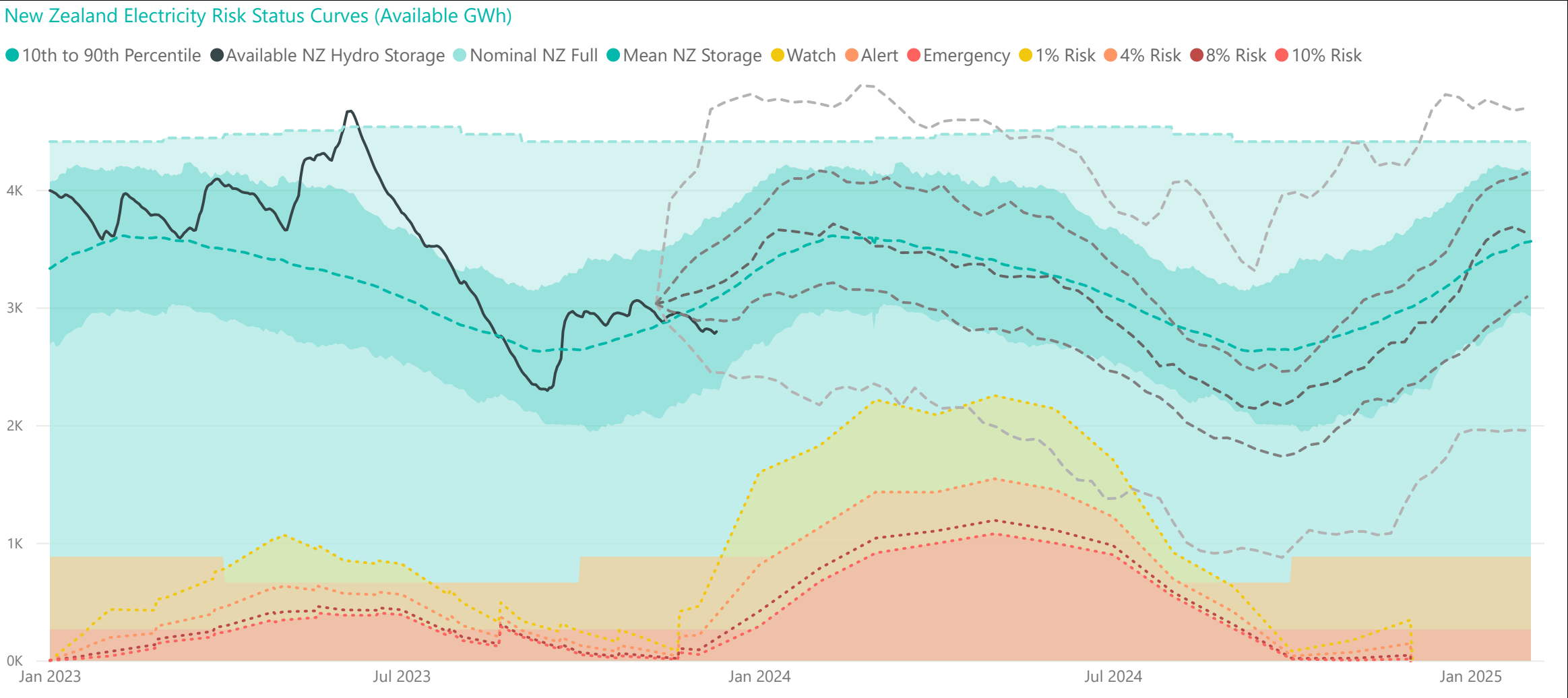


Generation Mix





Electricity Risk Curves



Electricity Risk Curve Explanation:

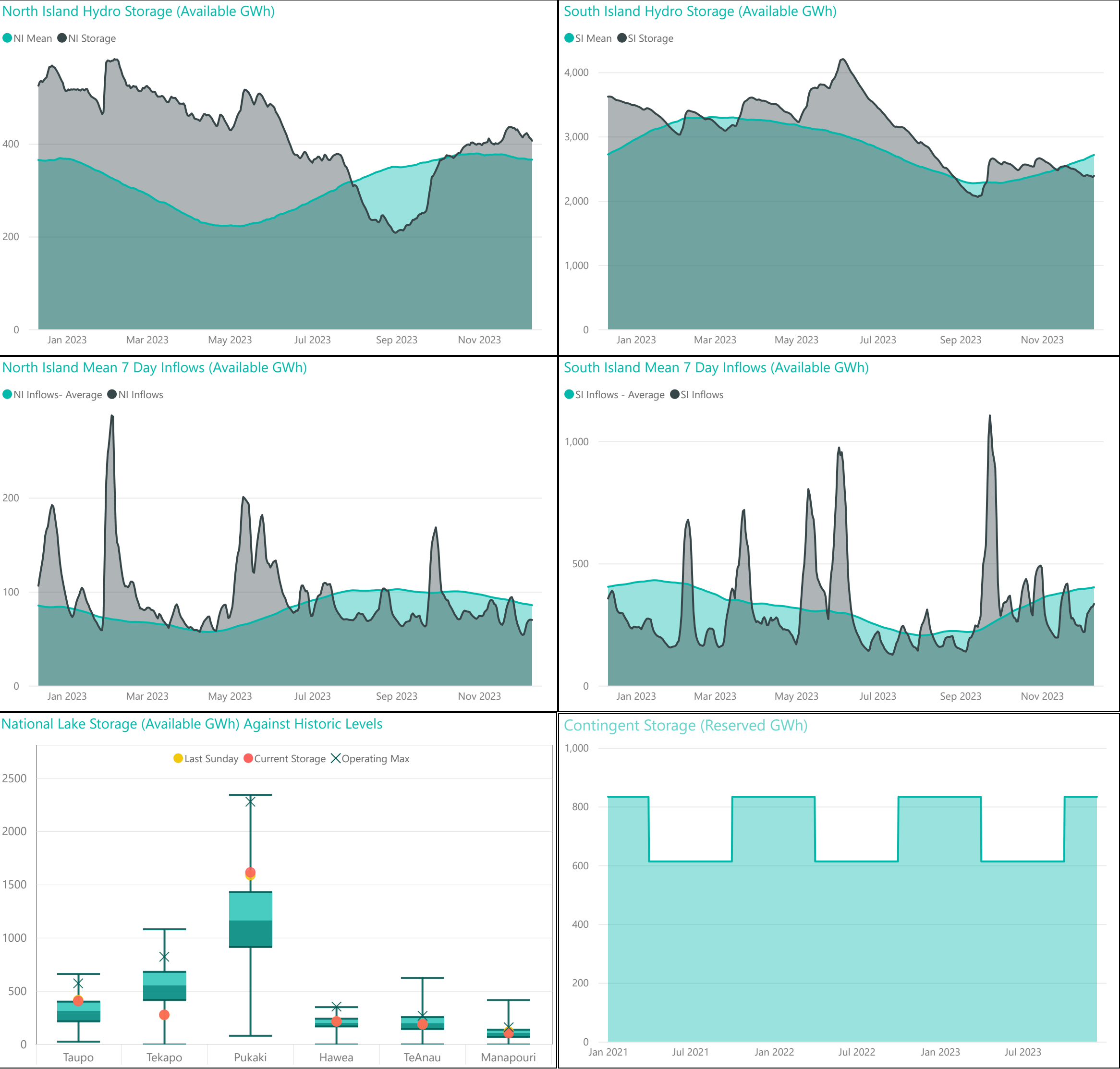
- Watch Curve - The maximum of the one percent risk curve and the floor and buffer
- Alert Curve - The maximum of the four percent risk curve and the floor and buffer
- Emergency Curve - The maximum of the 10 percent risk curve and the floor and buffer
- Official Conservation Campaign Start - The Emergency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



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>