Weekly Market Movements - Week Ended 7 January 2024

Overview

National hydro storage is now 90% of the of average for this time of year. This is an increase from 87% at our last update in December. Demand was low this week, especially on New Year's Day and 2 January. All residual generation margins were above 1,000 MW. Looking ahead, N-1-G margins are healthy throughout January and February.

In this week's insight, we look at low demand over the Christmas holiday period.

Security of Supply

Energy

Wet weather in the central North Island over the New Year period has caused North Island hydro storage to increase to 143% of the average for this time of year, up from 108% at our last update. Lake Taupo storage is now at 91% of its operating maximum. South Island storage is 84% of the average for this time of year, unchanged from our last update. National hydro storage is now 90% of the average for this time of year.

Capacity

Residual generation margins were very healthy last week, with all residual points well over 1000 MW. The minimum residual was 1,706 MW on the evening of Sunday 7 January.

Forecast N-1-G Margins are healthy throughout January and February. The latest NZGB report is available on the NZGB website.

Electricity Market Commentary

Weekly Demand

Demand was low last week, as is typical for the first week of January, at 659 GWh. Demand peaked at 4,725 MW on Thursday 4 January at 5:30 pm.

Weekly Prices

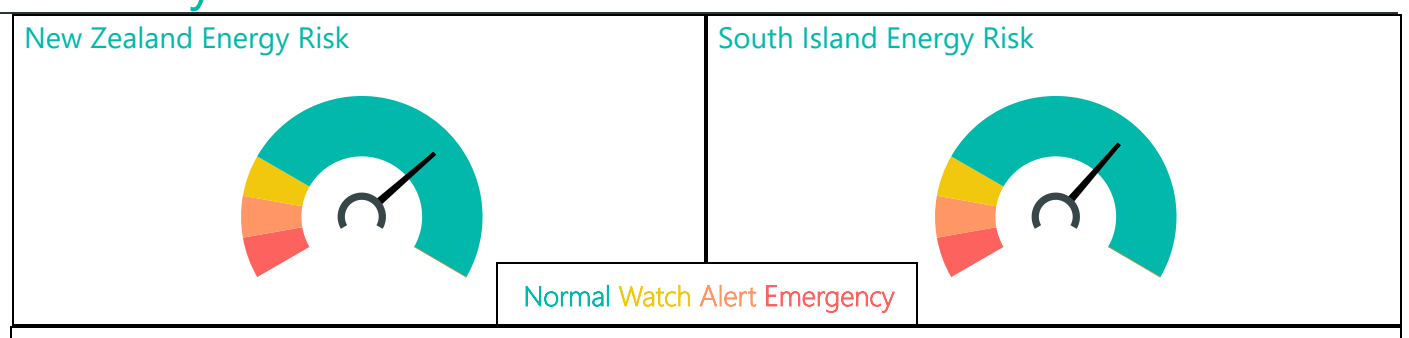
The average wholesale price at Haywards last week was $150/MWh, with prices lowest on the 1 January and 2 January public holidays. The Otahuhu price peaked at $302/MWh on Friday 5 December at 12:30 pm.

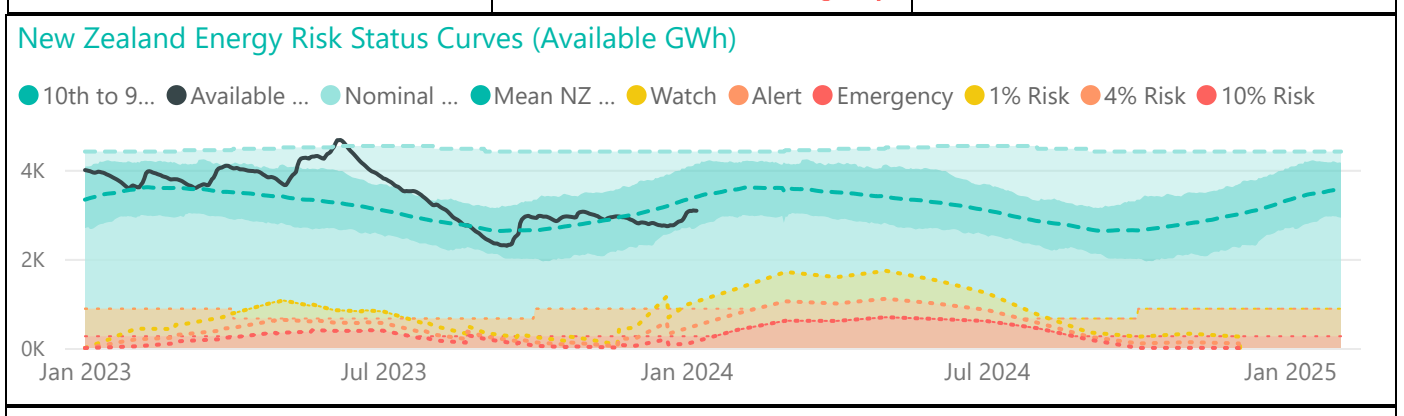
Generation Mix

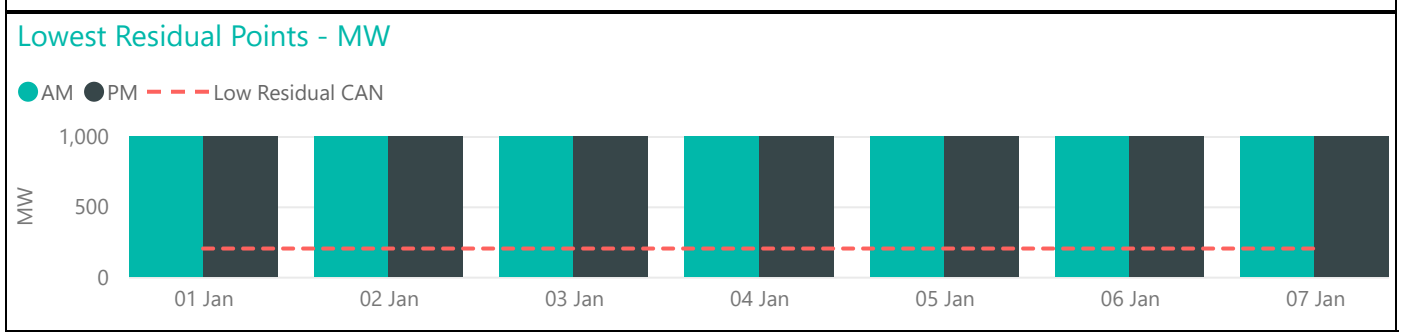
The renewable percentage of the generation mix last week was 88%. Wind generation was 7%, hydro 59% and geothermal 22%. The thermal contribution was 9%.

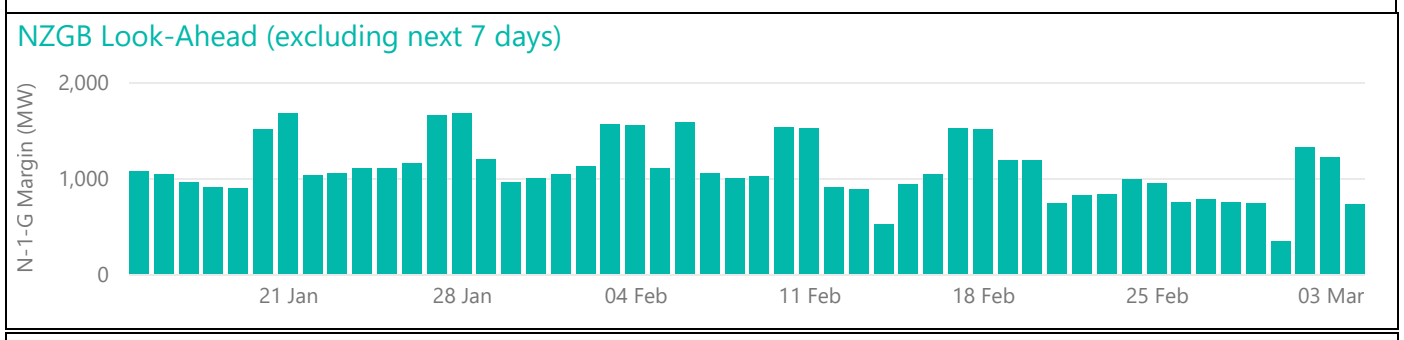
HVDC

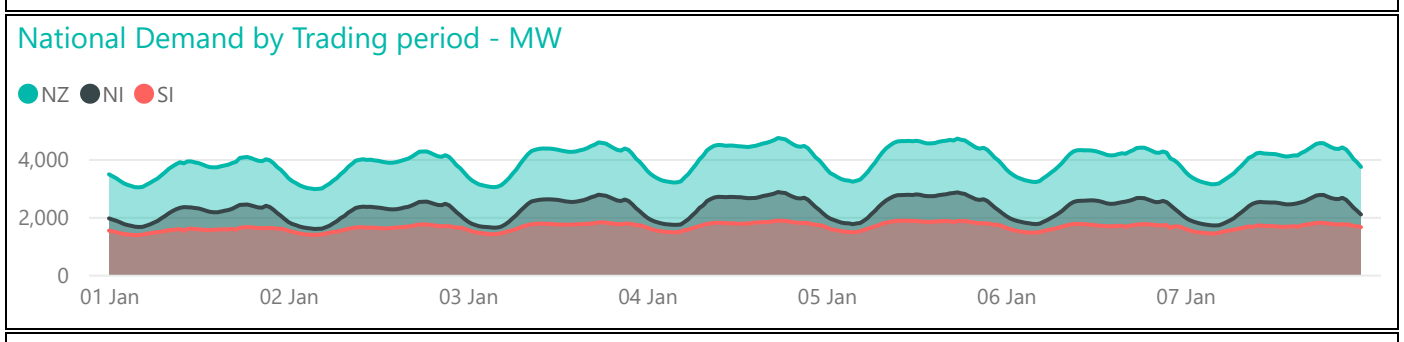
HVDC flows last week switched frequently between net southward and net northward. Daytime (higher demand) periods and periods of low wind generation coincided with northward flows, while nighttime periods and periods of high wind generation coincided with southward flows.

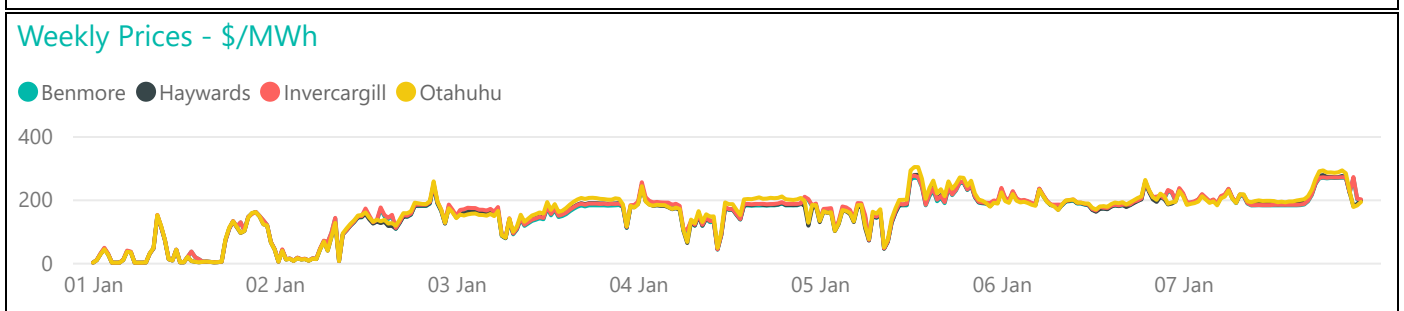


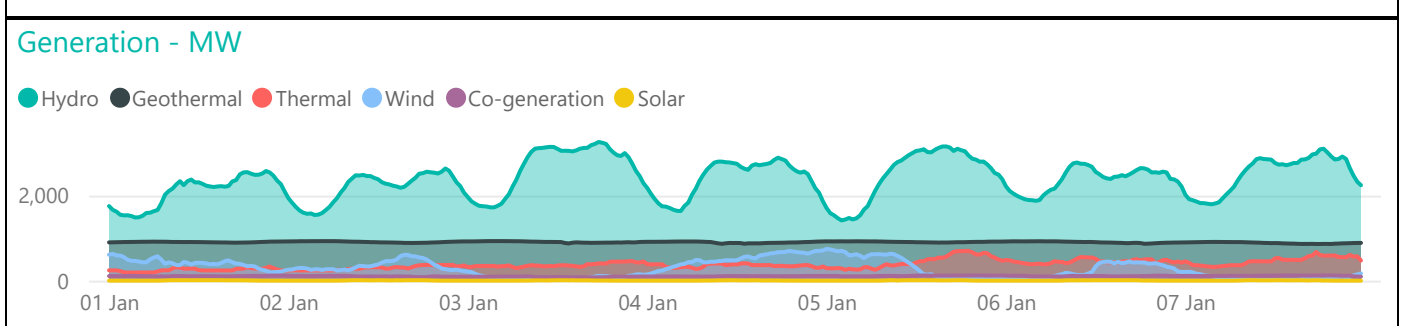


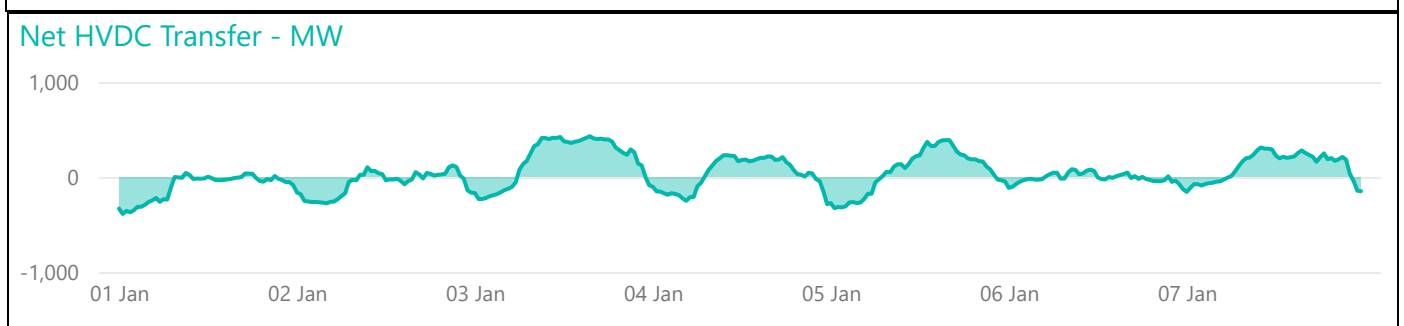


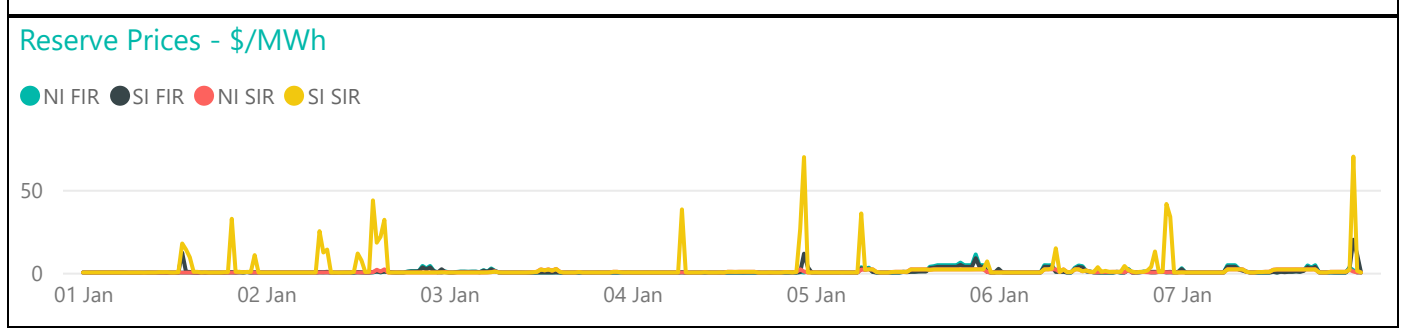












Weekly Summary Insight - Low demand over the holiday period

The lowest demand period last week was on 2 January at 3:30 am, where national demand was 2958 MW for the trading period. The lowest demand periods for each year usually occur over the Christmas/New Year period, so this is likely to remain the lowest demand period for this summer.

The table below shows when the lowest demand period occurred for the last five summers. In the summer of 2019/2020, the lowest demand occurred early in the Covid-19 level 4 lockdown, which began on 25 March.

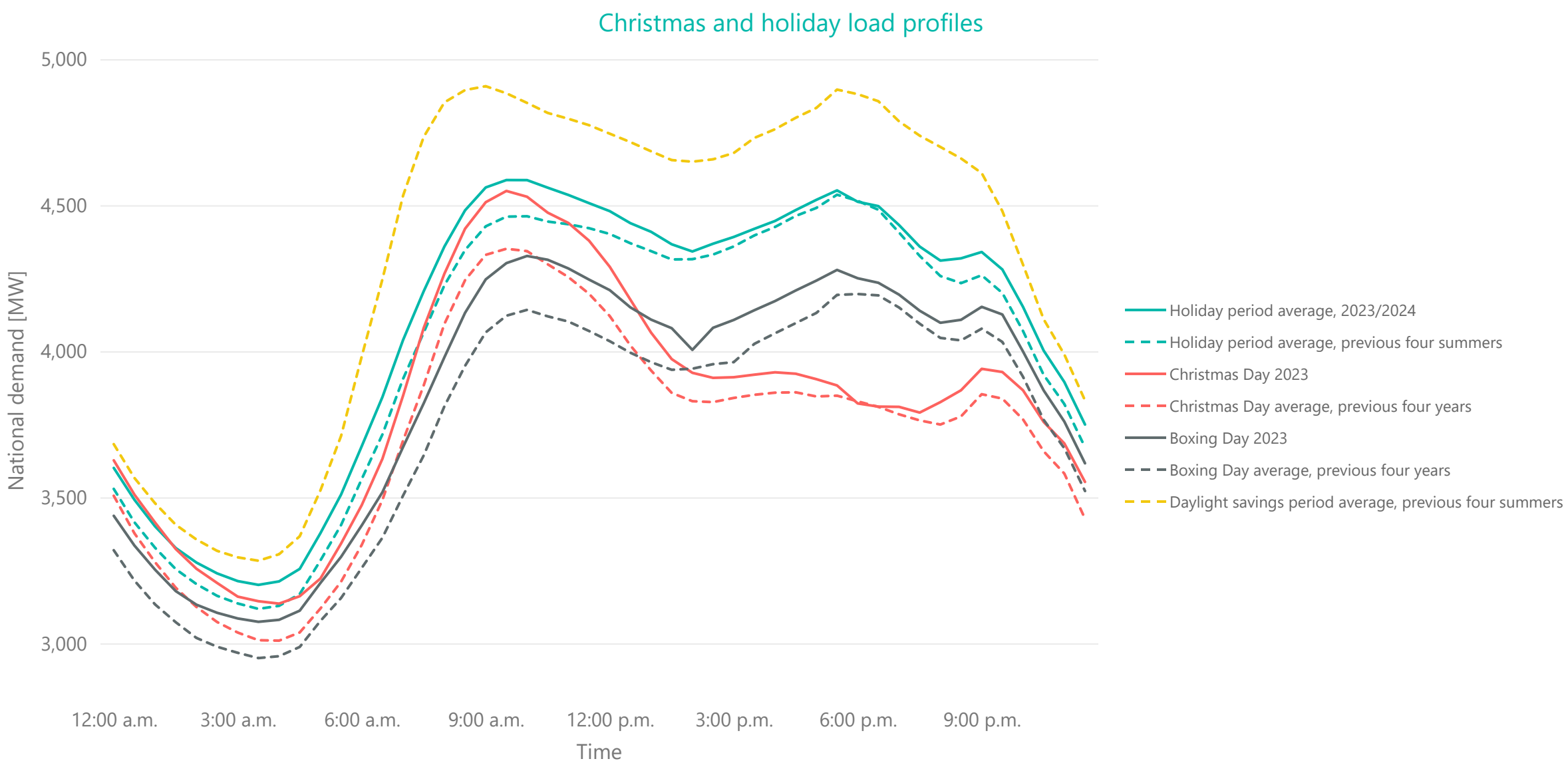
Lowest demand period each summer since 2019

Summer	Date	Time	National demand
2019/2020	Monday, 30 March 2020	3:30 a.m.	2828 MW
2020/2021	Monday, 4 January 2021	3:30 a.m.	2800 MW
2021/2022	Saturday, 1 January 2022	4:00 a.m.	2998 MW
2022/2023	Monday, 26 December 2022	3:30 a.m.	2854 MW
2023/2024	Tuesday, 2 January 2024	3:30 a.m.	2958 MW

The chart below shows load profiles for Christmas, Boxing Day, and the average daily load over the holiday period (19 December to 8 January). These are shown against the average for the daylight savings period (October to March) to show how much lower the Christmas holiday demand is than average summer demand.

Christmas day has a unique load profile. This consists of a standard morning peak, but then sees load drop off during the day, with a small peak (much lower than the morning peak) at 9 pm. This is when off-peak power use incentives kick in for many retail power plans .

The Christmas and Boxing Day morning peaks in 2023 were the highest out of the last five years. This was despite a slight dip in Boxing Day sales volumes, as reported by Retail NZ [1].

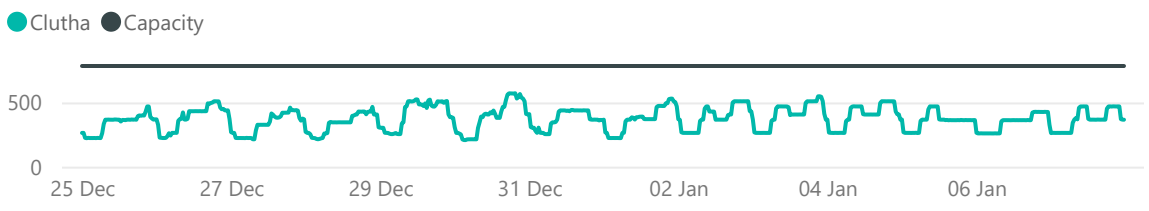


[1] https://www.rnz.co.nz/news/business/505646/boxing-day-sales-dip-retailers-blame-cost-of-living-interest-rates

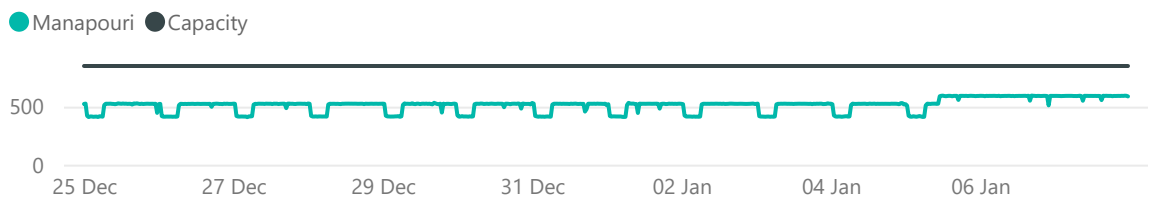
Generation Breakdown - Last Two Weeks

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

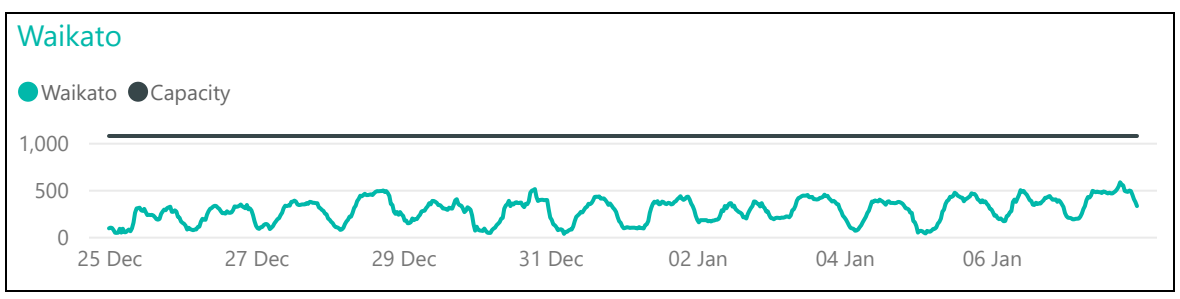
Clutha



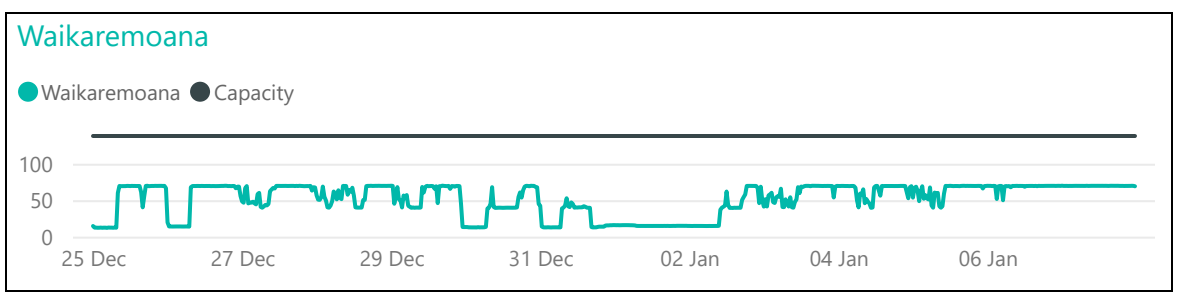
Manapouri



Waikato

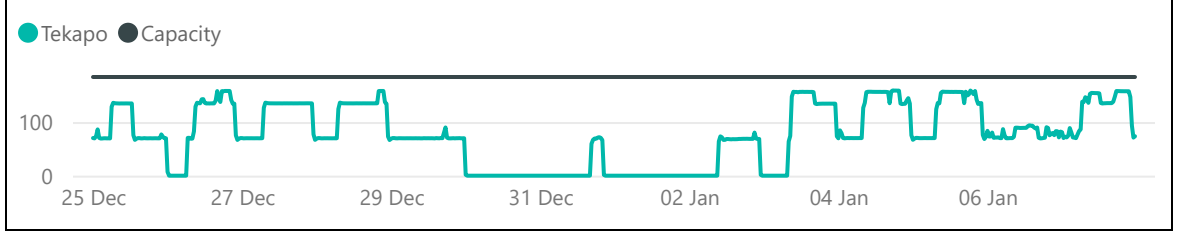


Waikaremoana

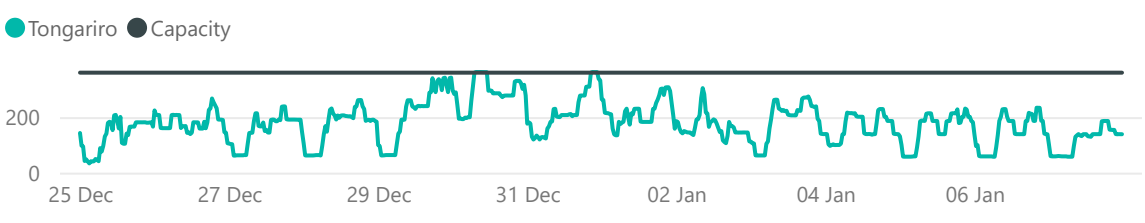


Waitaki

Tekapo

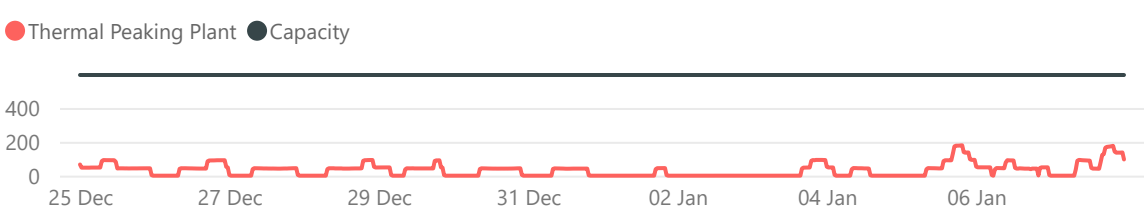


Tongariro

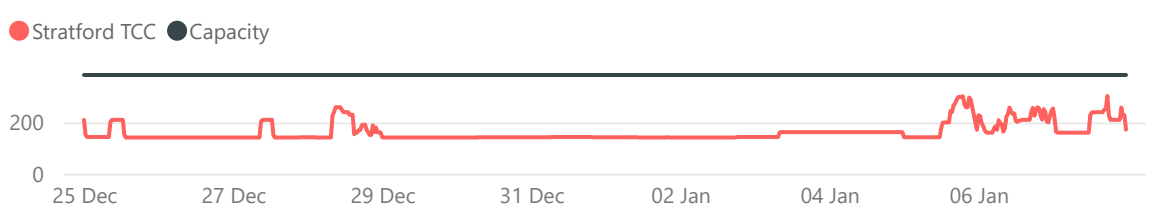


Other SI Hydro

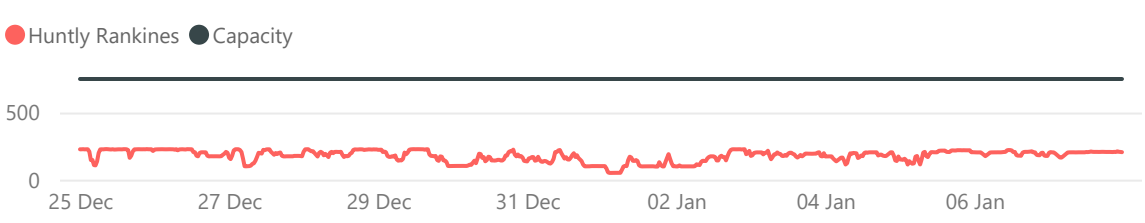
Thermal Peaking Plant



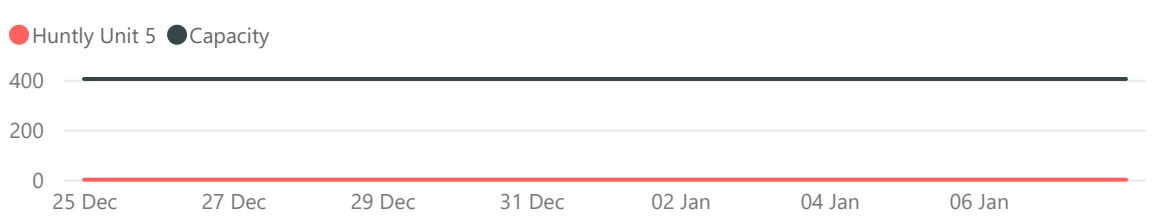
Stratford TCC



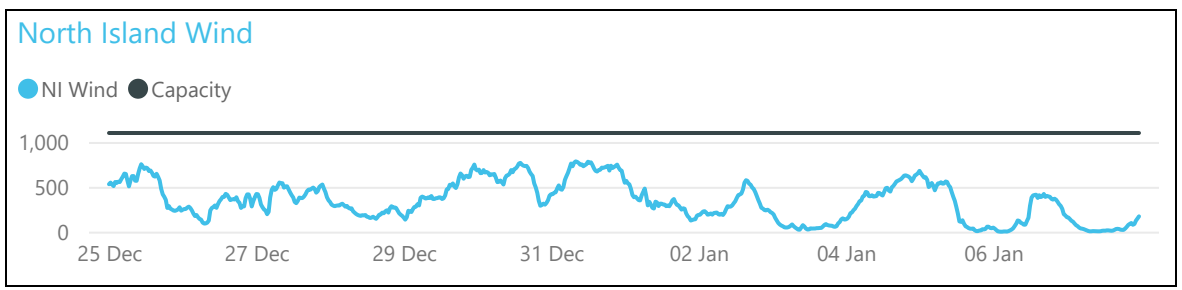
Huntly Rankines



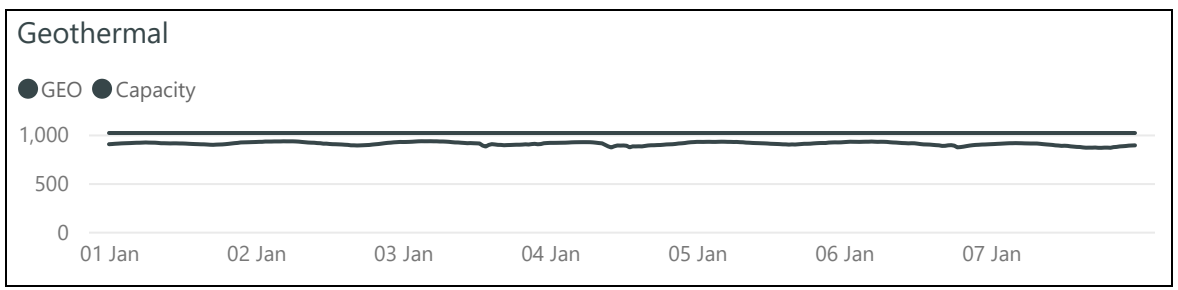
Huntly U5



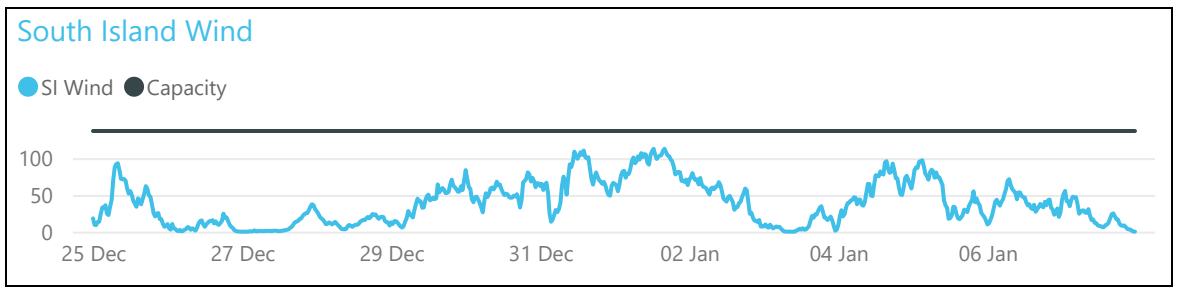
North Island Wind



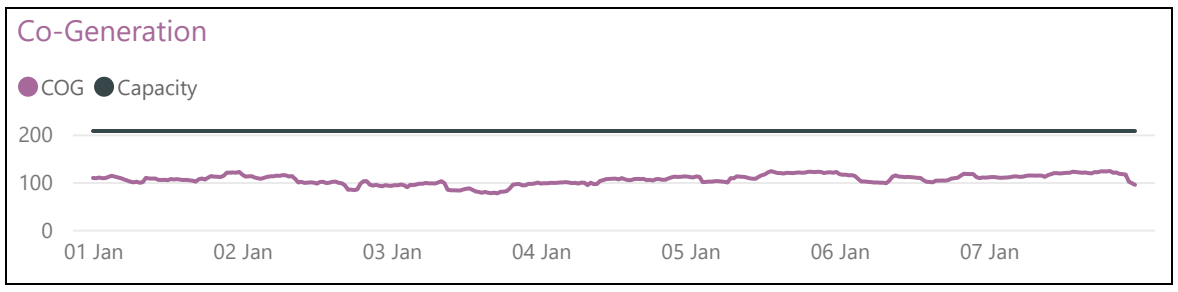
Geothermal



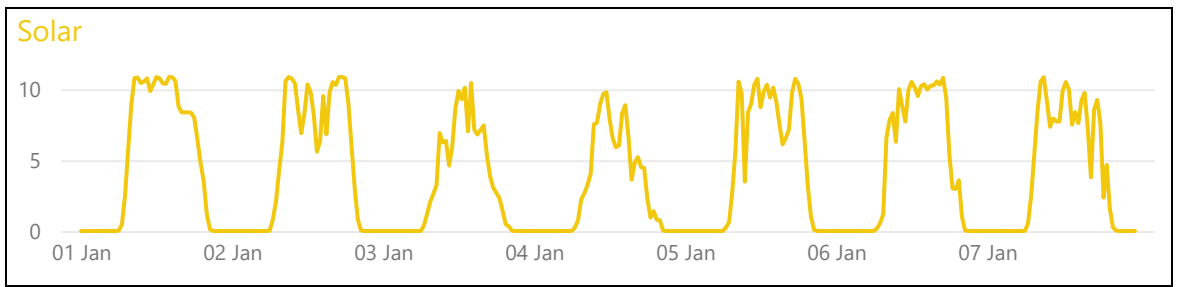
South Island Wind



Co-Generation

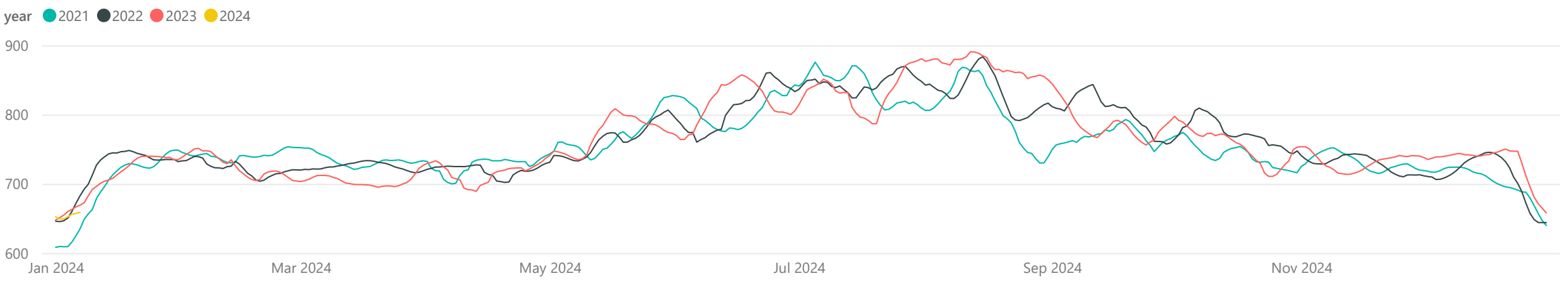


Solar

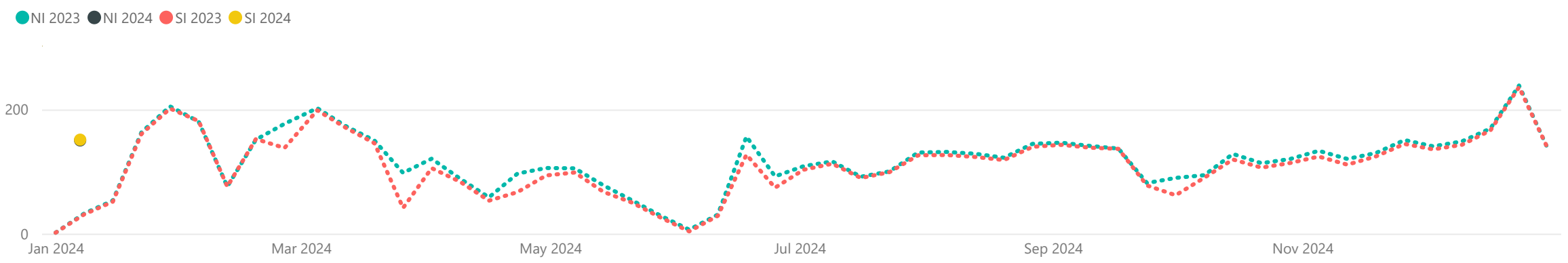


Weekly Profiles

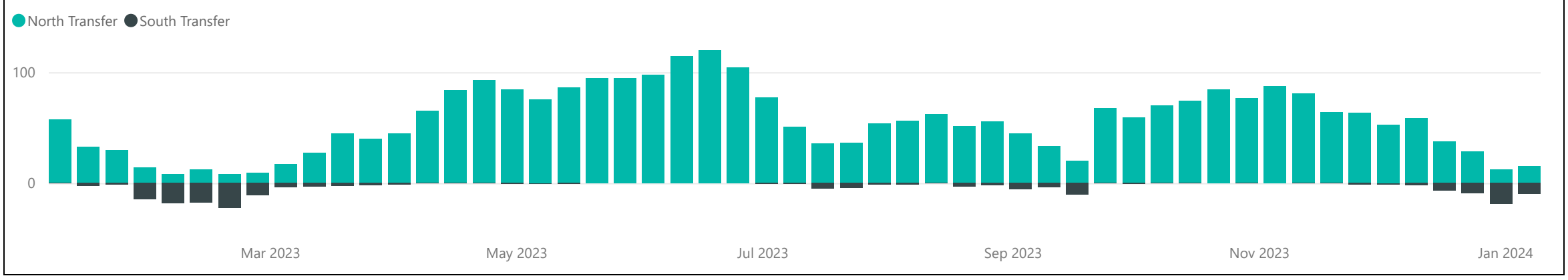
National Weekly Demand - GWh - 7 Day Rolling



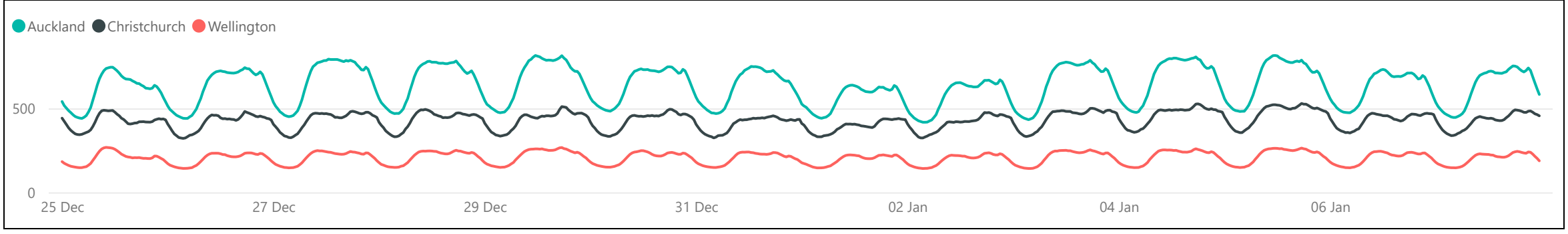
Weekly Spot Price - $/MWh



HVDC Transfer - Weekly GWh

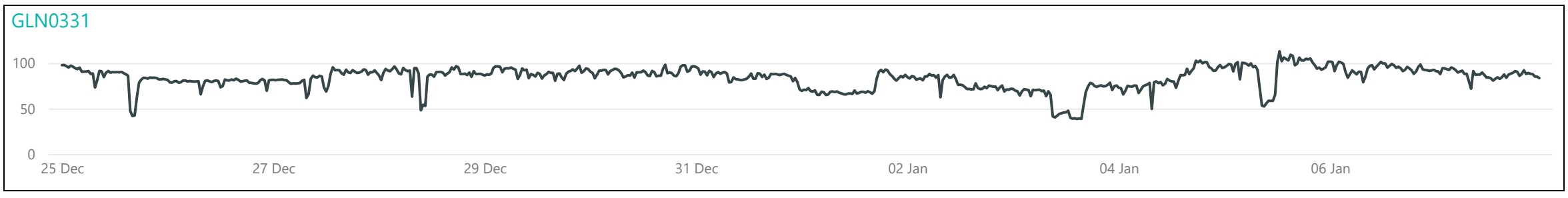


Conforming Load Profiles - Last Two Weeks *Measured in MW shown by region*



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

GLN0331



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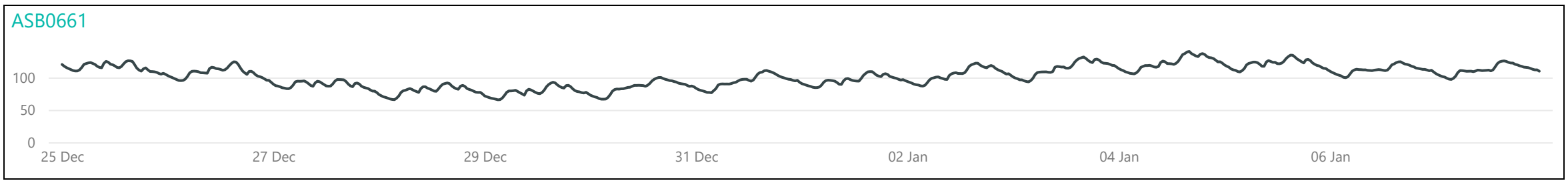
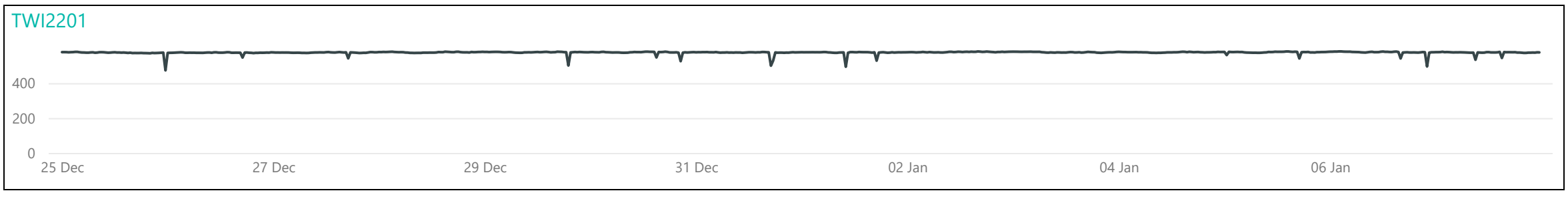


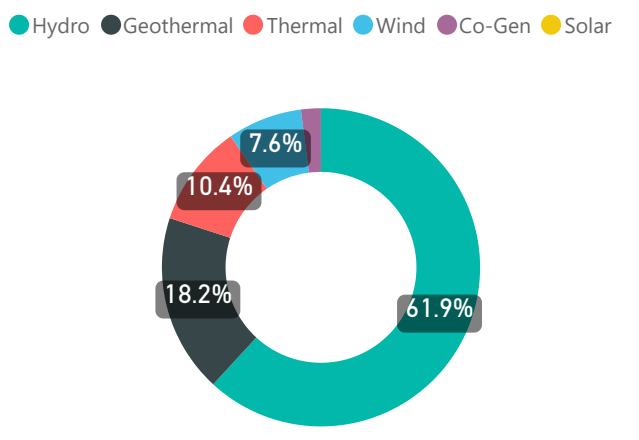
TWI2201



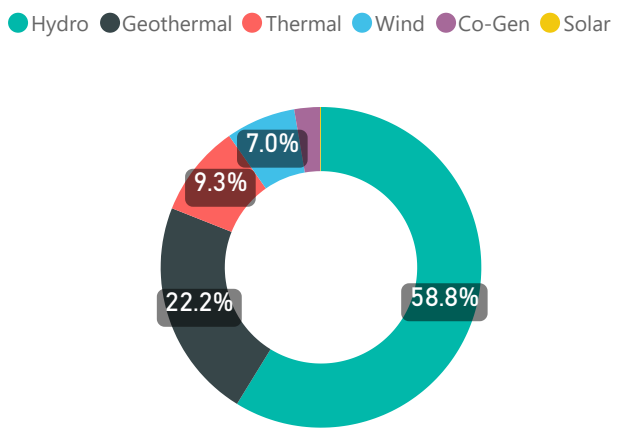
TRANSPOWER

Generation Mix

Last 52 Weeks Generation Mix - Weekly GWh



Last 7 Days Generation Mix - Weekly GWh



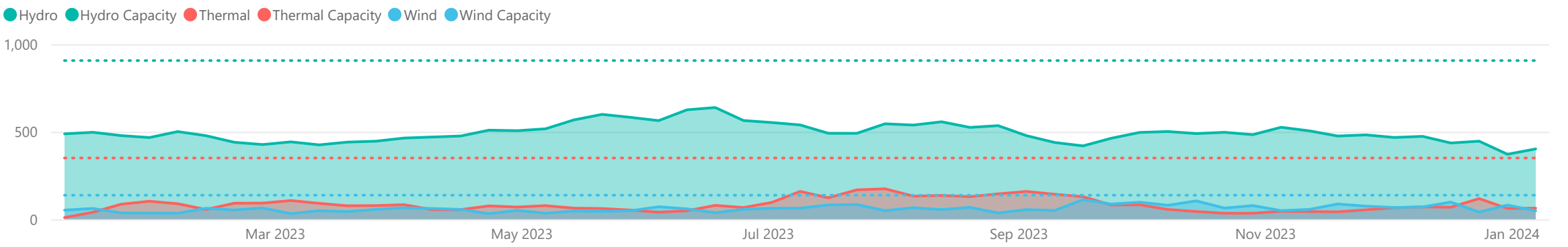
Average Metrics Last 7 Days

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
88%	47,591	69.5

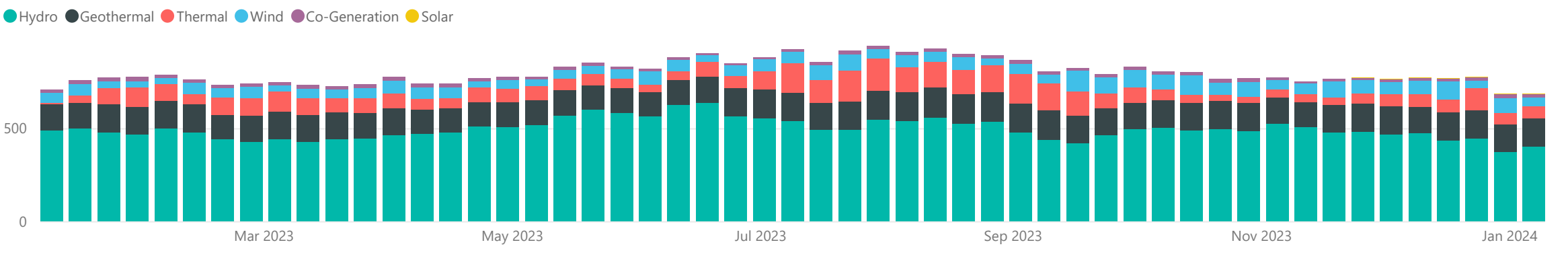
Average Metrics Last 52 Weeks

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
88%	60,218	74.1

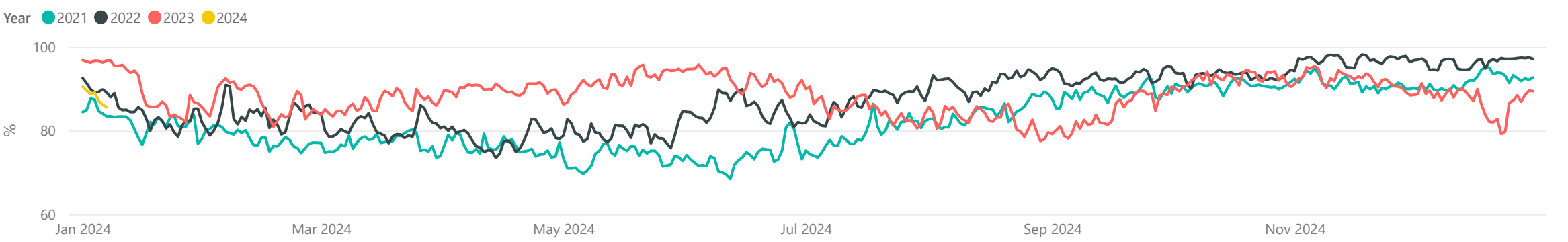
Weekly Generation Mix vs Capacity - GWh



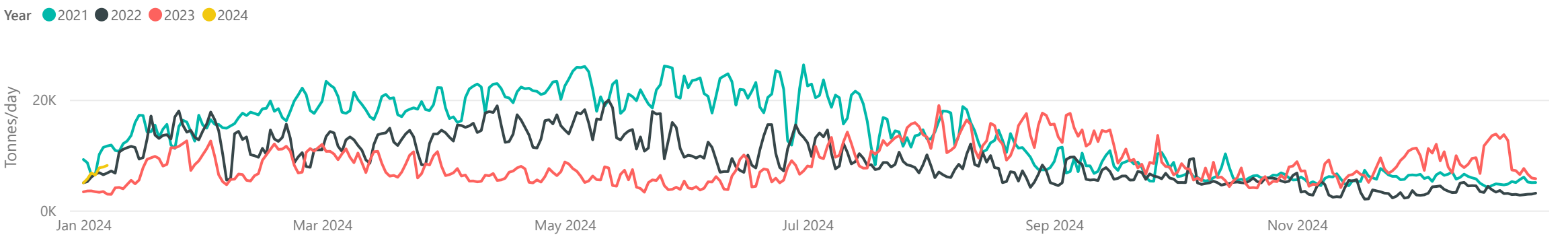
Weekly Generation Mix - GWh



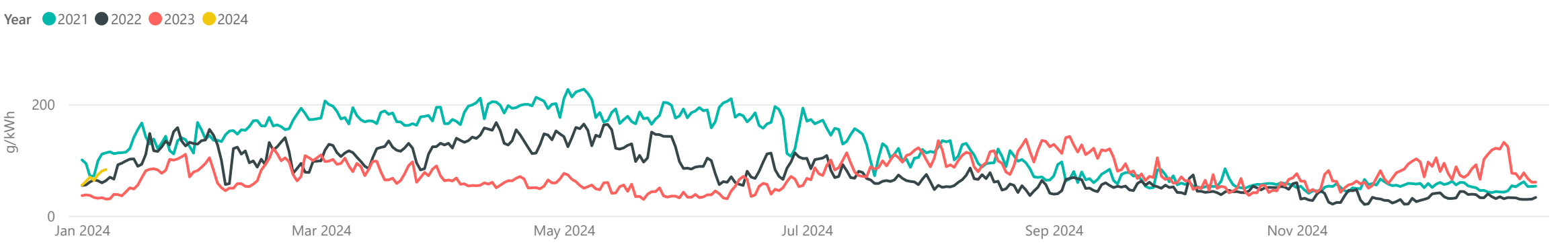
NZ Renewable Percentage



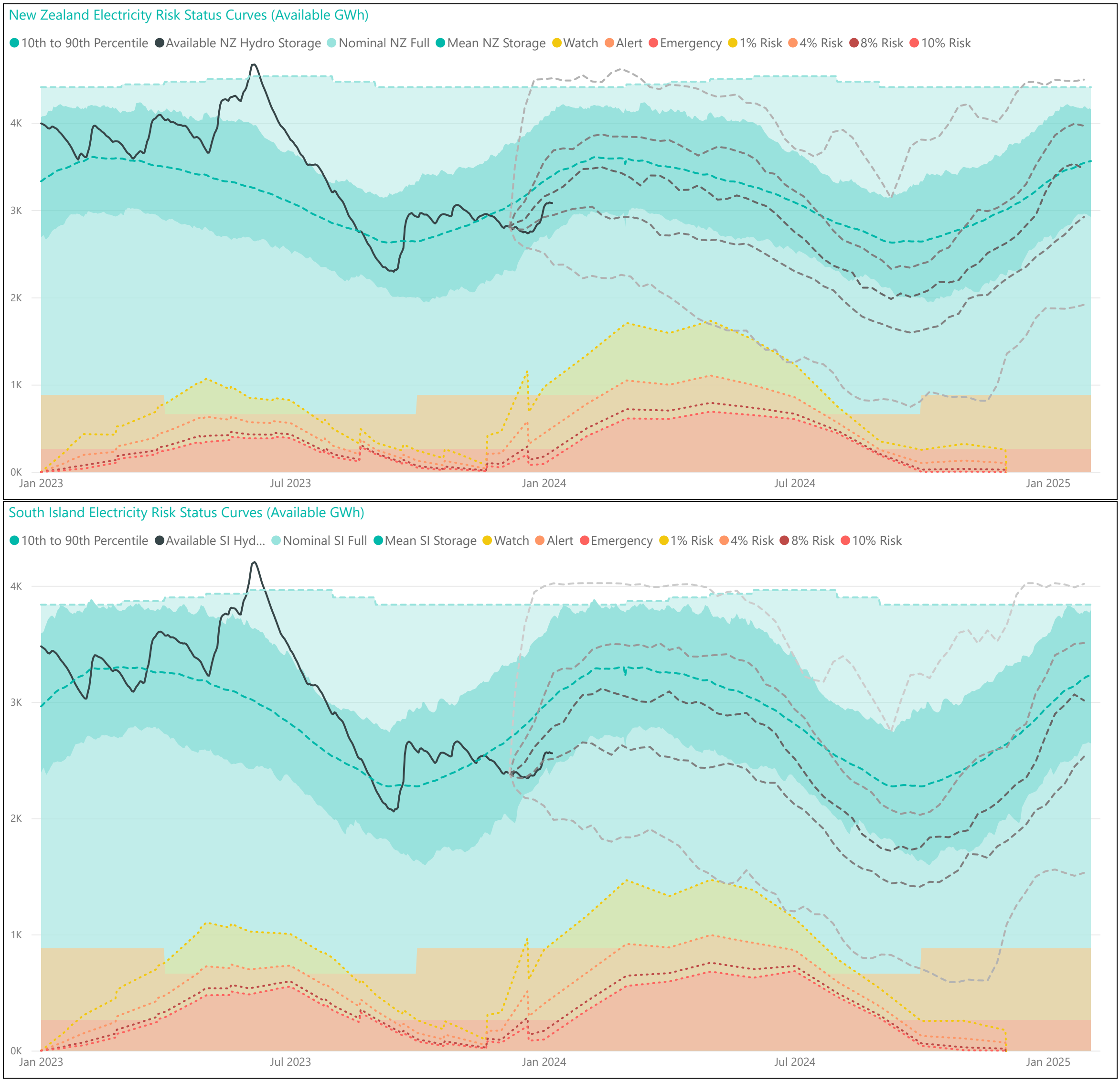
CO2 Tonnes/Day



CO2 g/kWh



Electricity Risk Curves



Electricity Risk Curve Explanation:

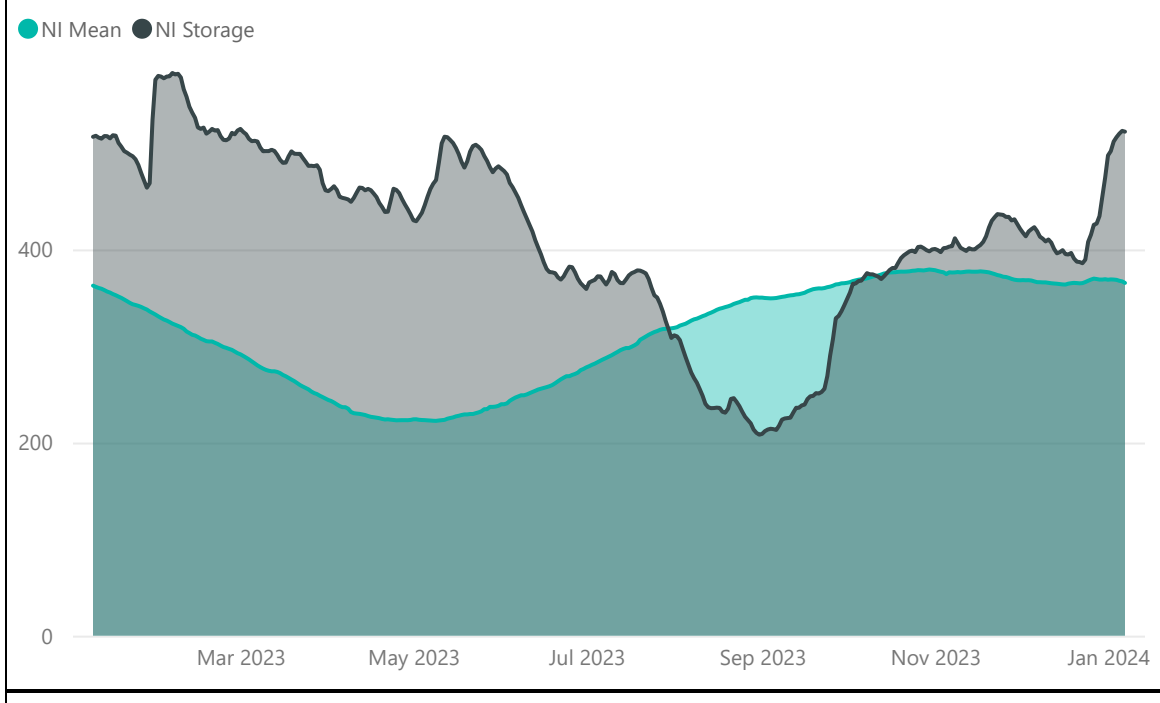
Watch Curve - The maximum of the one percent risk curve and the floor and buffer
Alert Curve - The maximum of the four percent risk curve and the floor and buffer
Emergency Curve - The maximum of the 10 percent risk curve and the floor and buffer
Official Conservation Campaign Start - The Emergency Curve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

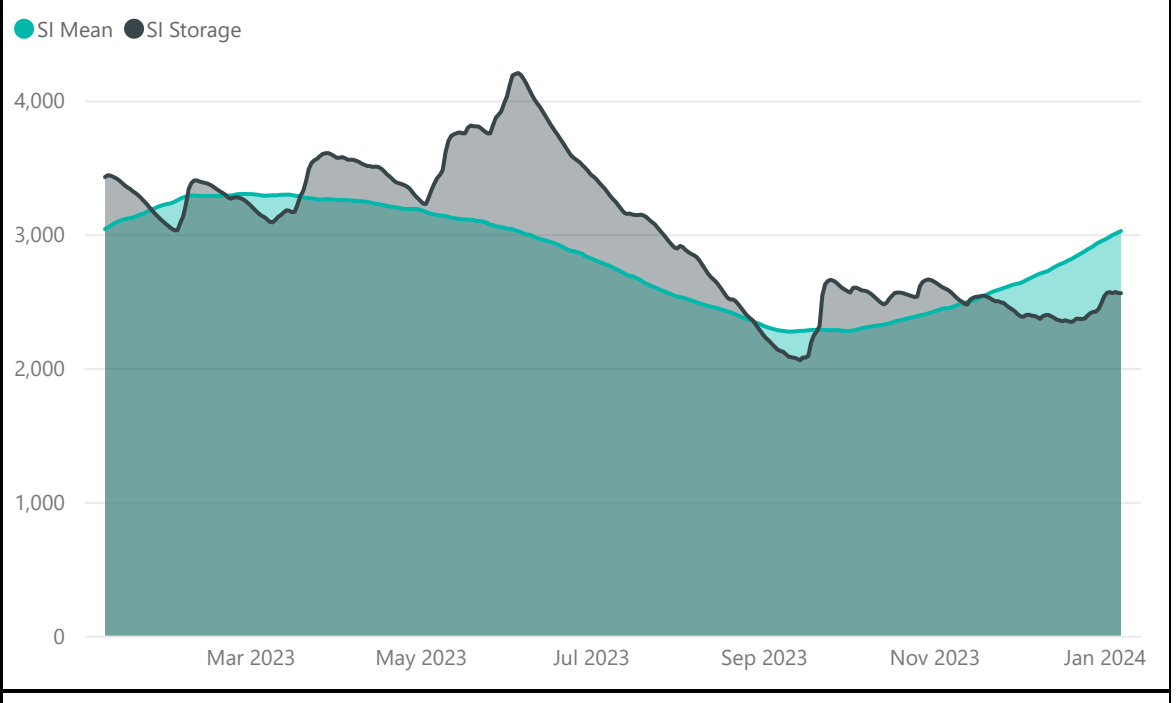
The dashed grey lines represent the minimum, lower quartile, median, upper quartile and the maximum range of the simulated storage trajectories (SSTs). These will be updated with each Electricity Risk Curve update (monthly).

Hydro Storage

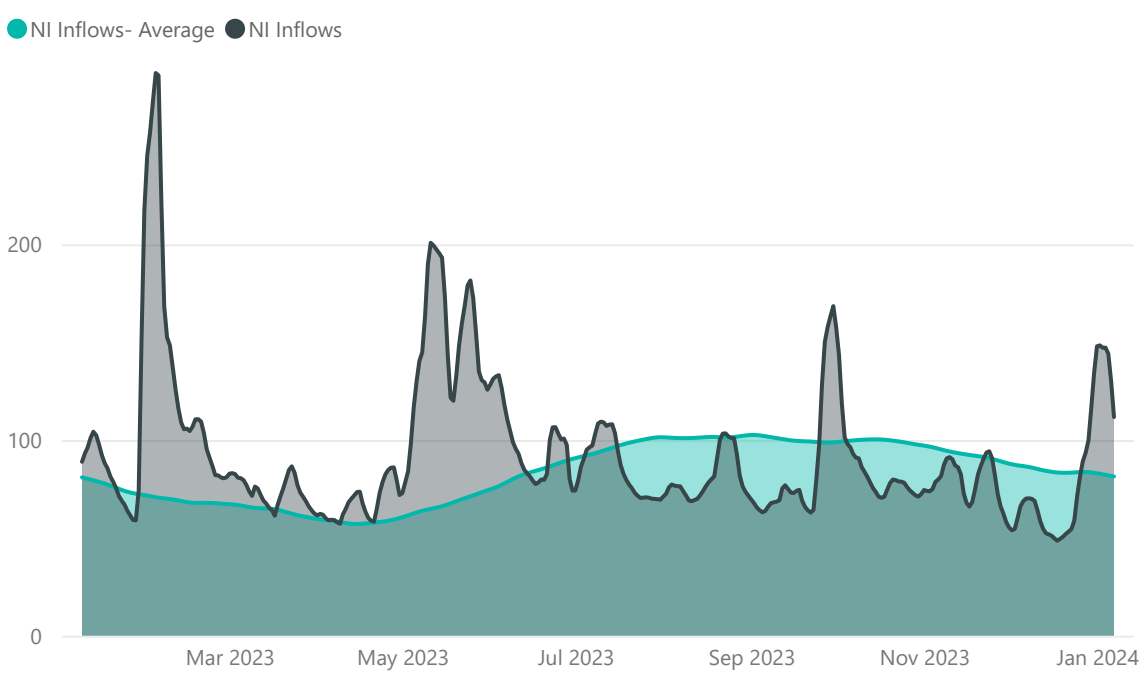
North Island Hydro Storage (Available GWh)



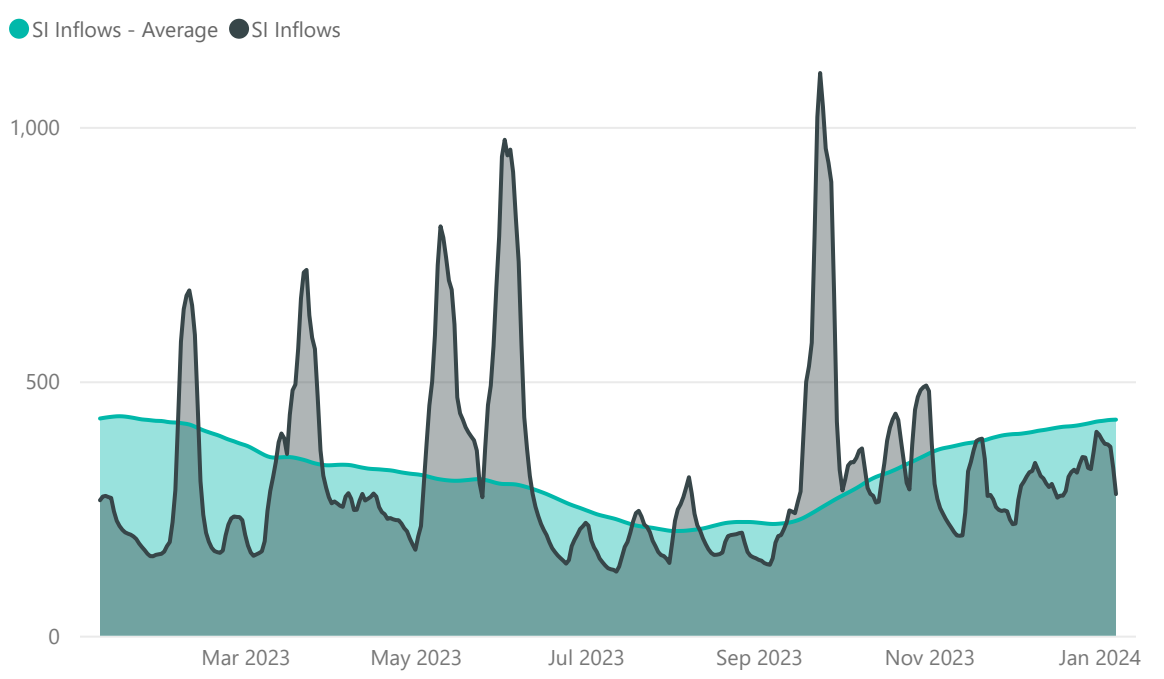
South Island Hydro Storage (Available GWh)



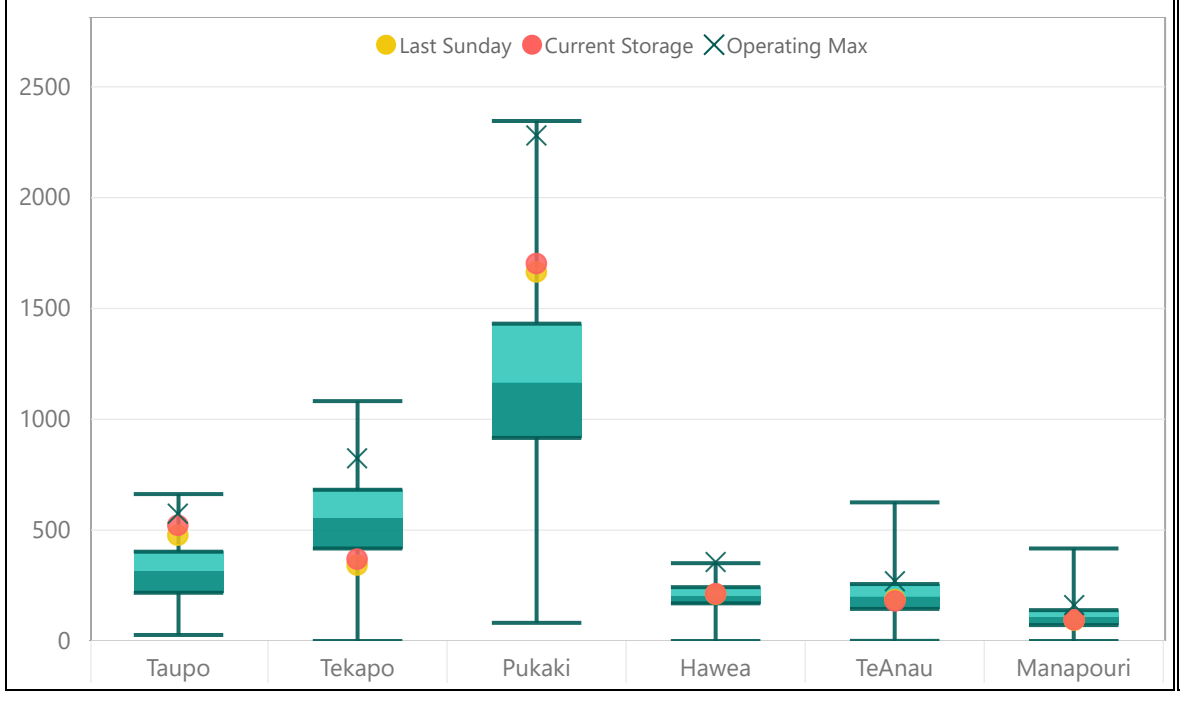
North Island Mean 7 Day Inflows (Available GWh)



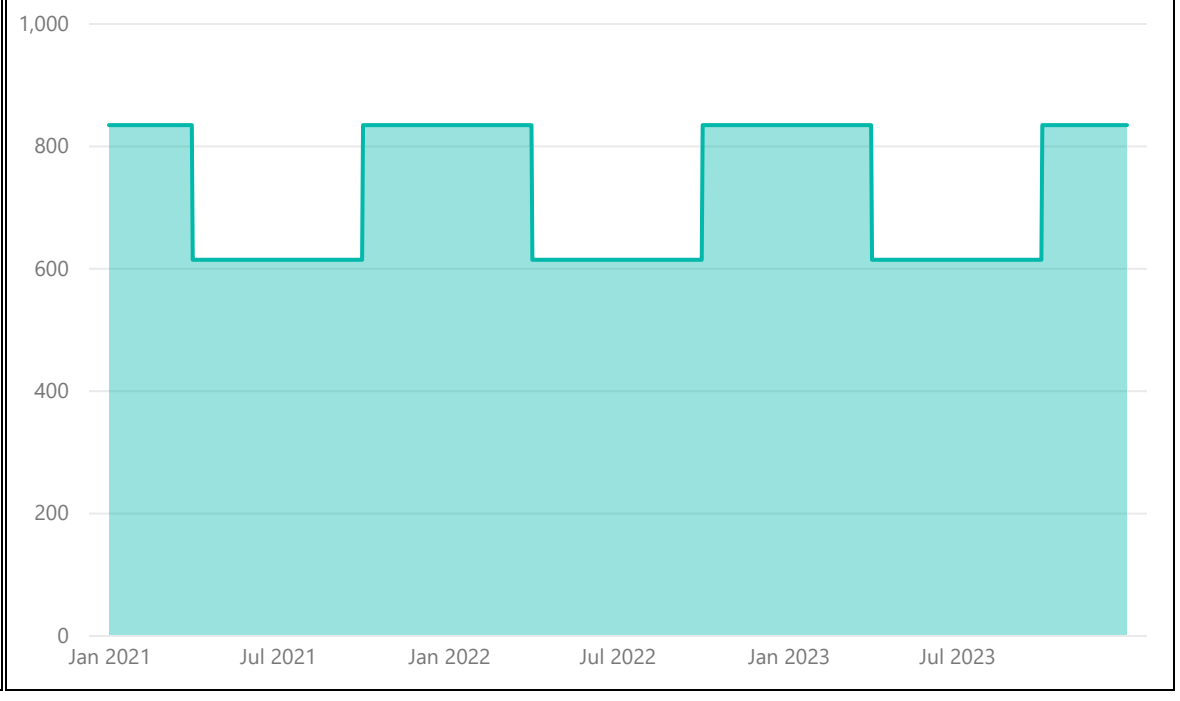
South Island Mean 7 Day Inflows (Available GWh)



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