Weekly Market Movements - Week Ended 11 February 2024

Overview

Hydro storage, demand and the generation mix were mostly unchanged last week from the week before. There was one evening peak with a relatively low residual and high prices, which we look at in this week's insight.

Security of Supply

Energy

National hydro storage is at 102% of the historic mean, down from 103% last week. South Island storage is at 97% of the historic mean, down from 99%, and North Island storage remains at 158% of the historic mean.

Capacity

The lowest residual last week was 385MW on Wednesday evening. This coincided with low wind generation and the week's second highest daily peak. This is discussed further in the insight.

Forecast N-1-G margins are healthy throughout the forecast horizon to late March. The HVDC outages running from 21 February - 14 March are considered in the margin calculation. The lowest N-1-G margin during the forecast period is 430 MW on 21 March. The latest NZGB report is available on the NZGB website.

Electricity Market Commentary

Weekly Demand

Last week demand fell slightly to 740 GWh from 743 GWh the week prior. Demand peaked at 5,438 MW on the evening of Thursday 8 February

Weekly Prices

The average wholesale price at Otahuhu last week was $129/MWh, up from $100/MWh the week prior. The Otahuhu price peaked at $722/MWh on Wednesday 7 February at 16:30, with a spike in Fast Instantaneous Reserve (FIR) prices in both islands at around the same time. Part of our insight discussion will cover the differences between the forward schedules and real-time that led to this price spike not showing up in the forward schedules beforehand.

Generation Mix

The generation mix last week was similar to the week before. The renewable percentage of the generation mix dropped to 91% from 93%. The thermal share increased from 5% to 7%. Hydro generation declined from 63% to 61%. Wind generation remained at 11%.

HVDC

All daytime HVDC flows last week were northward. There was southward flow most nights, coinciding with periods of low demand and high North Island wind generation.
The upcoming HVDC outages are:
Pole 3 outage: 21 February - 24 February
Pole 2 outage: 25 February - 14 March
Bipole outage: 24 February - 25 February
For further details see the Customer Advice Notice.

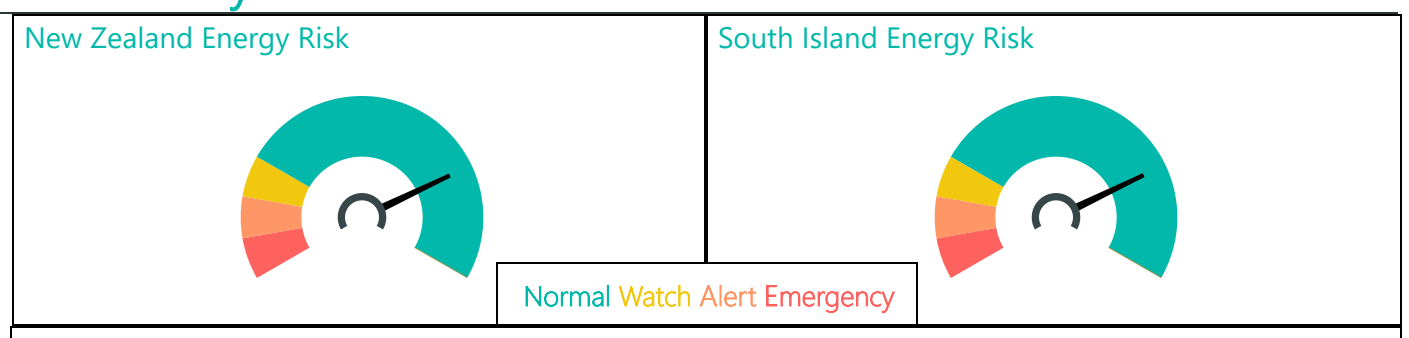
SOSA Generator, Distributor and Demand Response Survey

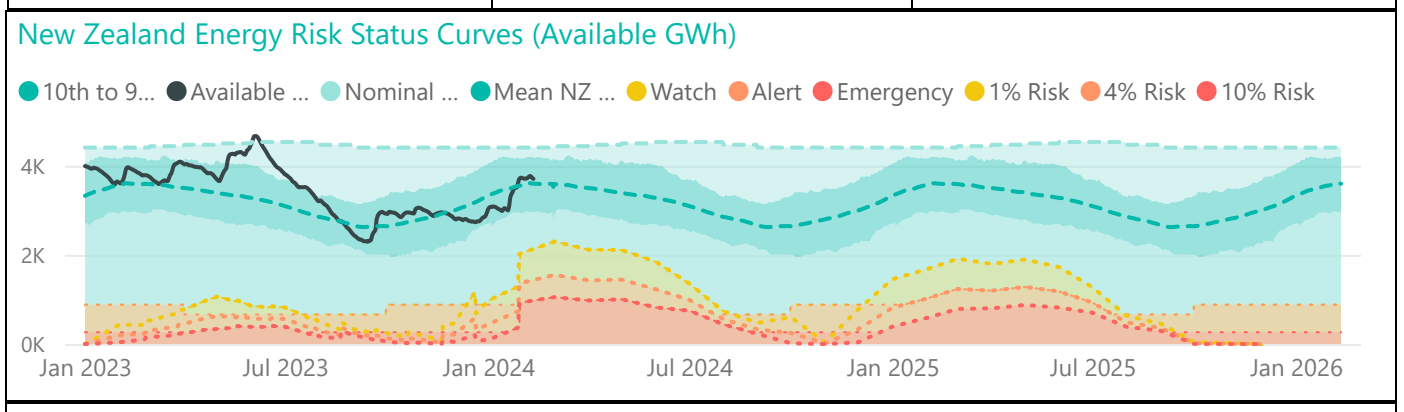
If we have contacted you about the Generator, Distributor and Demand Response Survey for the 2024 Security of Supply Assessment (SOSA), please respond to this if you have not already. The response window will close shortly.

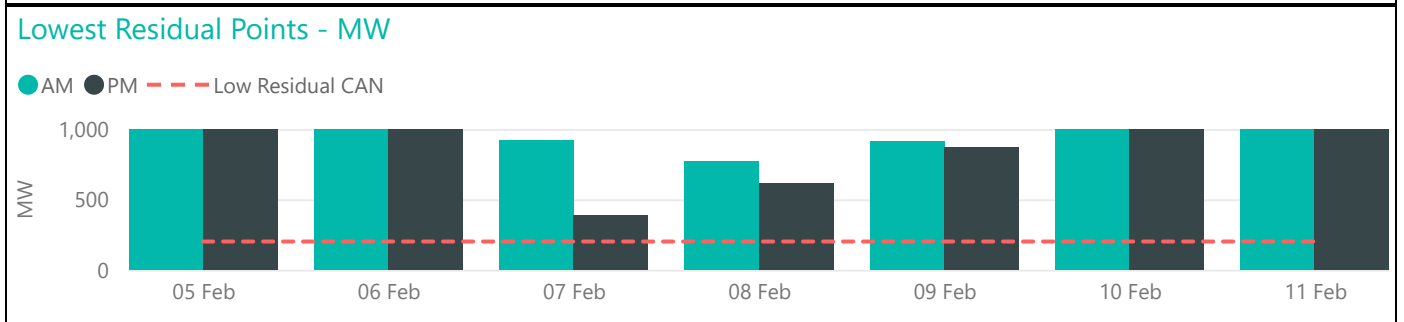
SOROP Consultation

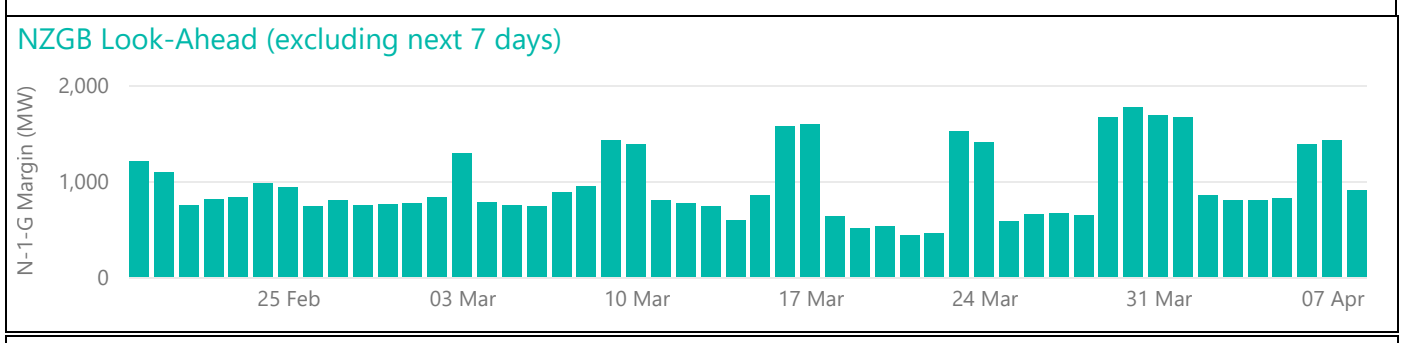
Transpower is seeking views from the electricity industry on proposed changes to the System Operator Rolling Outage Plan (SOROP). The consultation runs from 7 February for 4 weeks until 6 March. There is then a 2 week period for cross submissions until 20 March. Please see our website for further details.

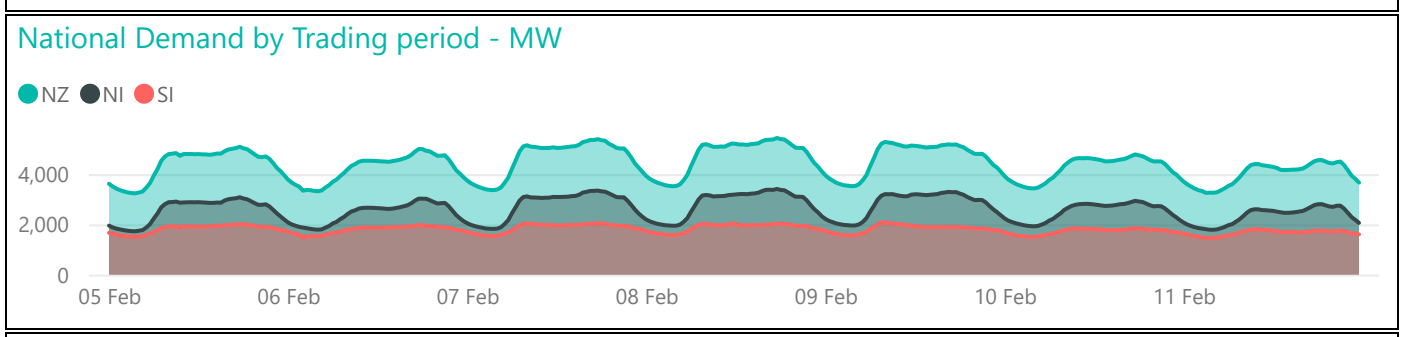
The SOROP is one of Transpower's key security of supply planning and policy documents in it's system operator role. The review is required as the current version of the SOROP has been in place since 2016 and security of supply risks are changing.

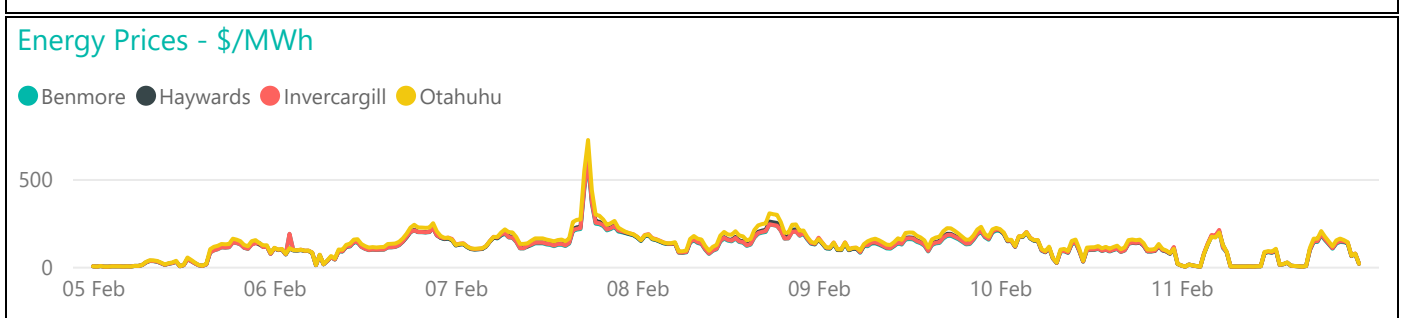


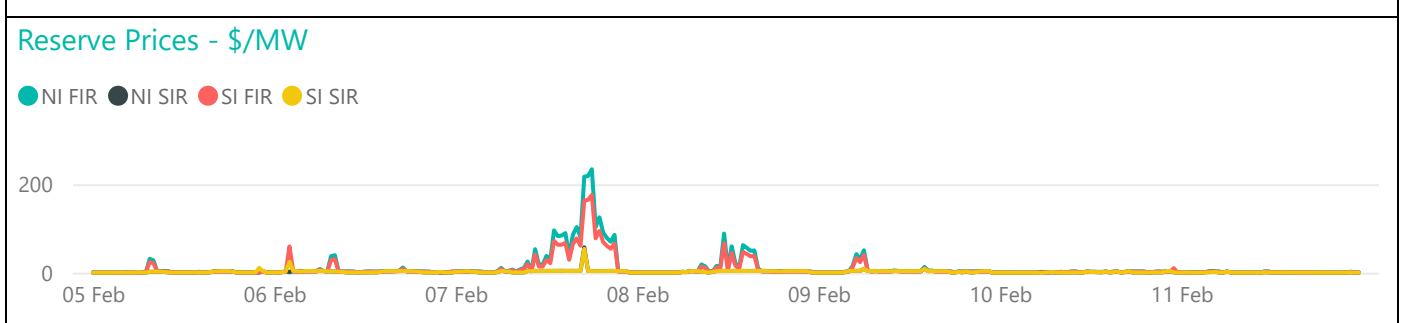


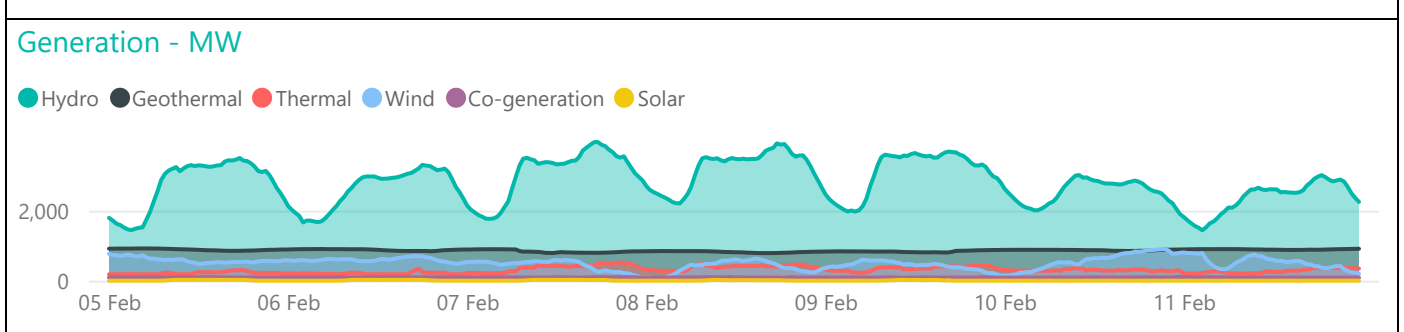


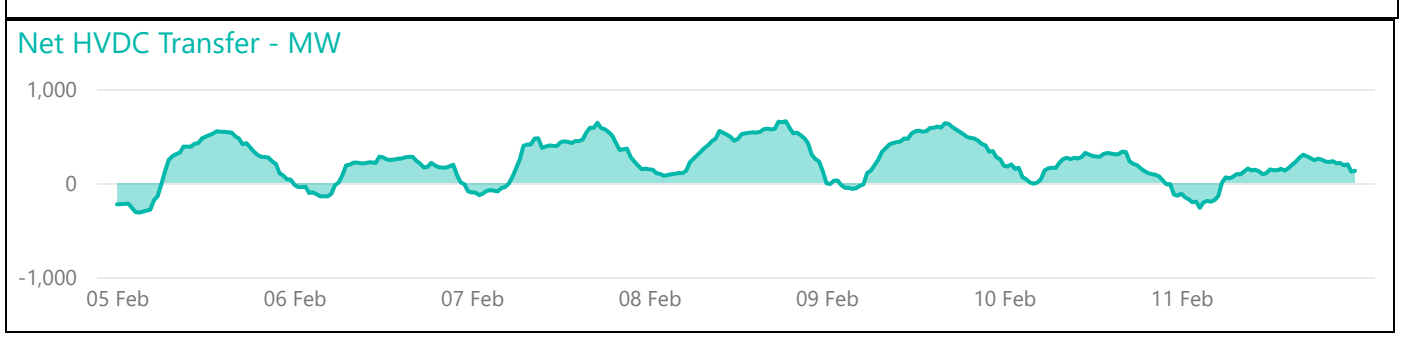












Weekly Summary Insight - Persistence wind offers

In this insight we look at the impact of persistence and non-persistence wind offers and their impact on the residuals.

Offers submitted by wind farms for trading periods up to two hours in the future are required to be based on a persistence forecast model unless otherwise agreed with the Electricity Authority.

The submitted persistence offers assume that the wind resource for a wind farm will not change in the next two hours, therefore they will over-forecast generation when there is a declining wind trend and under-forecast generation when there is an increasing wind trend. This can be seen in Figure 1. The chart on the left shows the total offers and actual generation for the set of wind farms that were submitting persistence offers. The chart on the right shows offers and actual generation for the set of wind farms that were not submitting persistence offers. This clearly shows the persistence offers over-forecasted wind generation when it was dropping.

Non-persistence offers forecasted the decline in wind generation much more accurately. Figure 2 shows the changes affecting the residual between what was forecasted for the 17:30 trading period in one of the forward schedules (the 16:00 NRSS, or short non-responsive schedule) and the 17:30 RTD (real-time dispatch schedule). The main changes were a higher load than forecasted and lower generation than forecasted from wind farms that submitted persistence offers. The forward schedules are also intended to communicate information about future prices to the market. The wind and load forecasting errors shown in Figure 2 meant that prices in the forward schedules were much lower than the final prices. For example, the final price at Haywards for 17:30 was $629/MWh while the 16:00 NRSS forecasted $243/MWh and the 16:00 PRSS (short price-responsive schedule) forecasted $229/MWh.

We will be working with industry to reduce impact of these forecast errors. The Authority also has a project reviewing the forecasting of wind generation in the market.

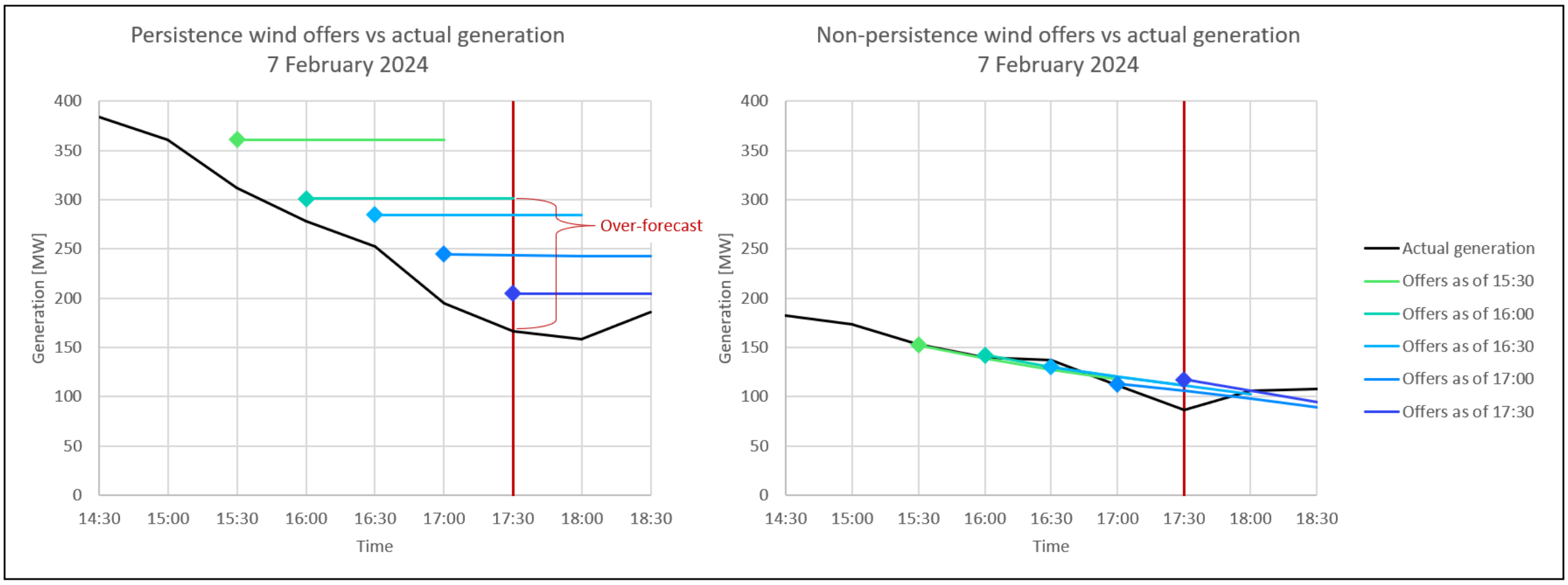


Figure 1: Due to a declining wind trend, persistence offers over-forecasted wind generation

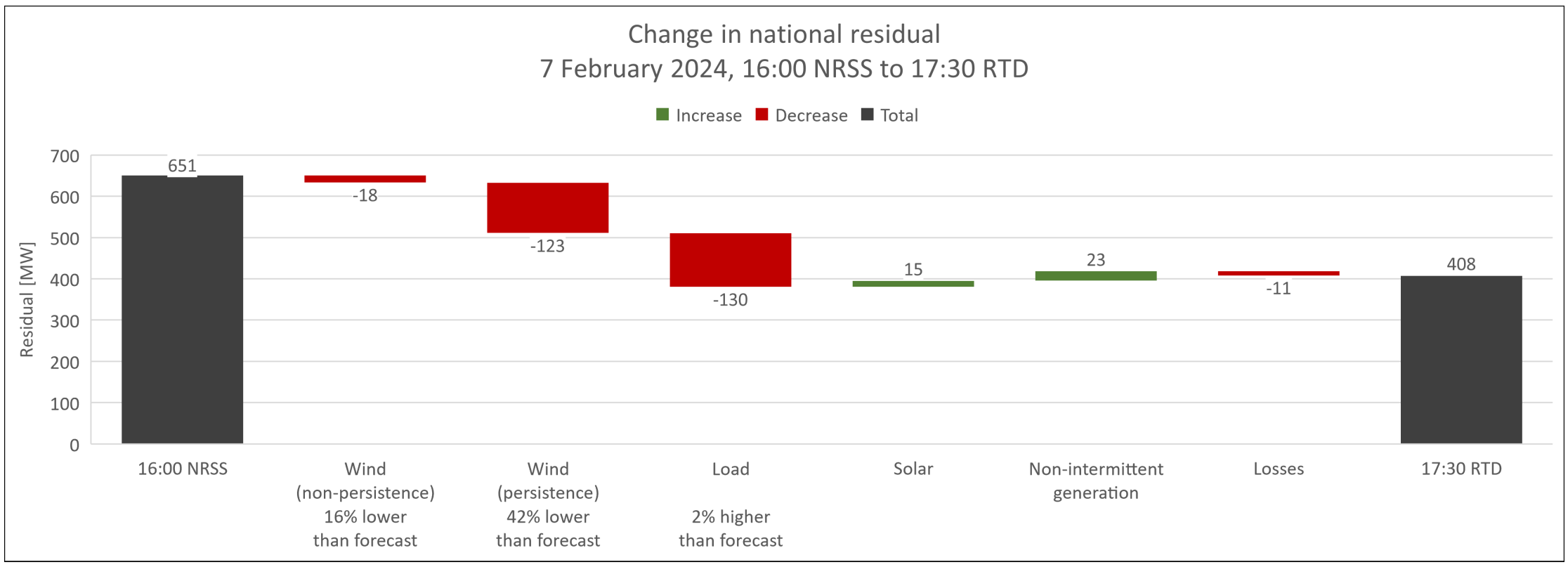
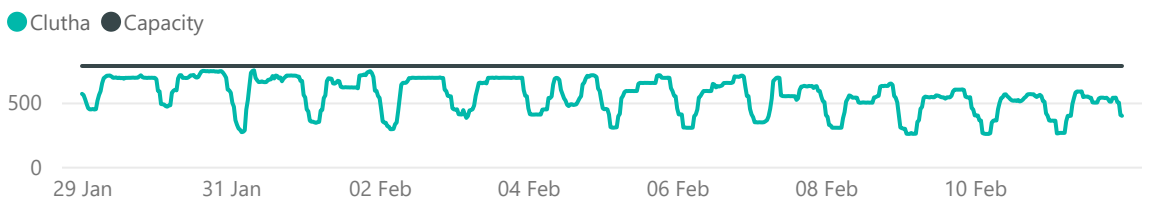


Figure 2: The main contributors to the drop in residual between the 16:00 NRSS and real time were under-forecast load and over-forecast wind generation, the latter mostly from wind farms submitting persistence offers

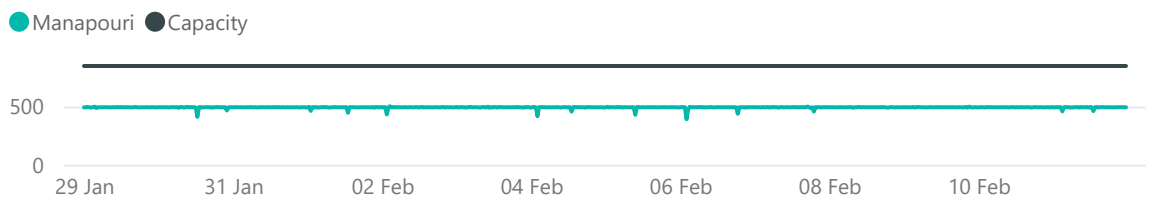
Generation Breakdown - Last Two Weeks

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

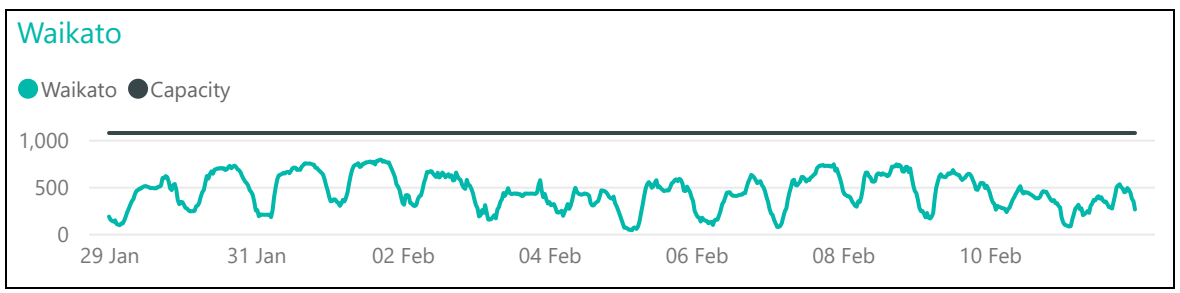
Clutha



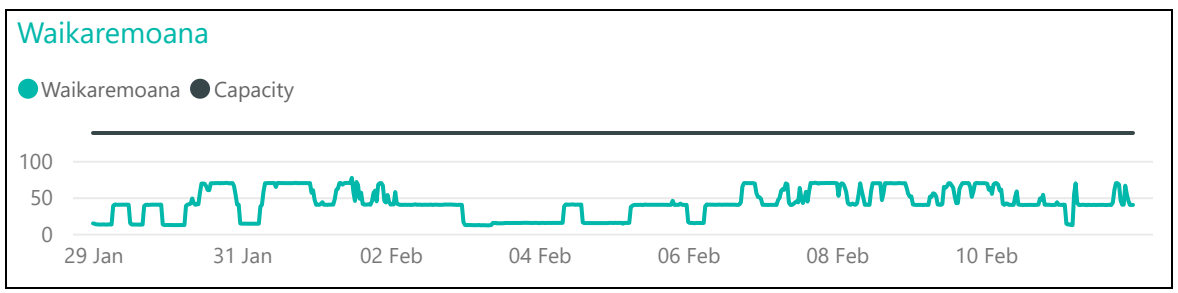
Manapouri



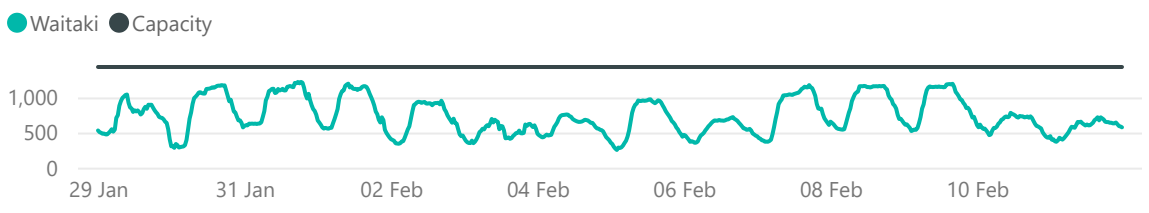
Waikato



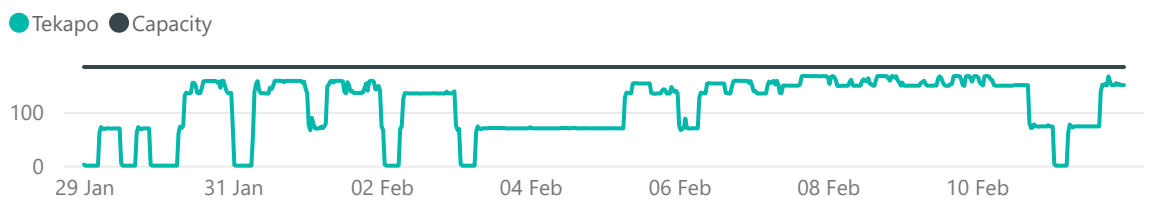
Waikaremoana



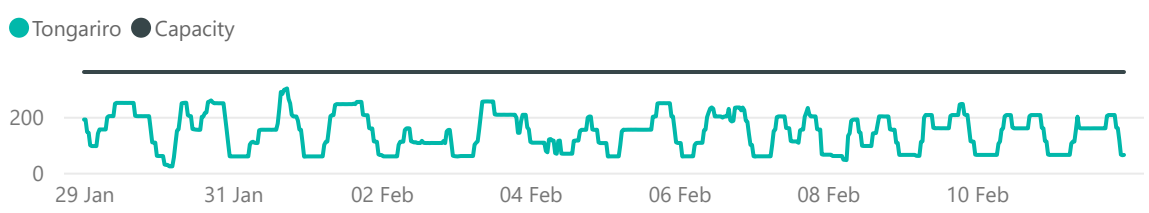
Waitaki



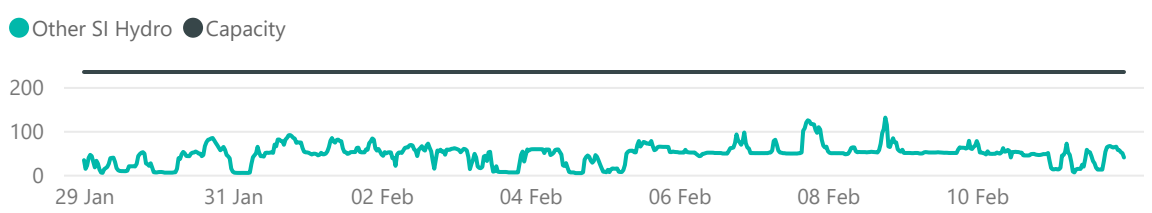
Tekapo



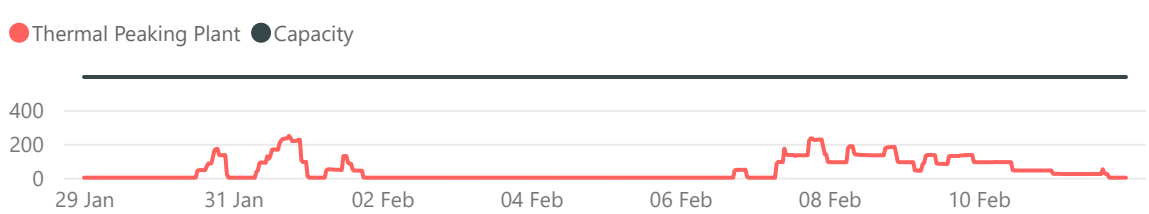
Tongariro



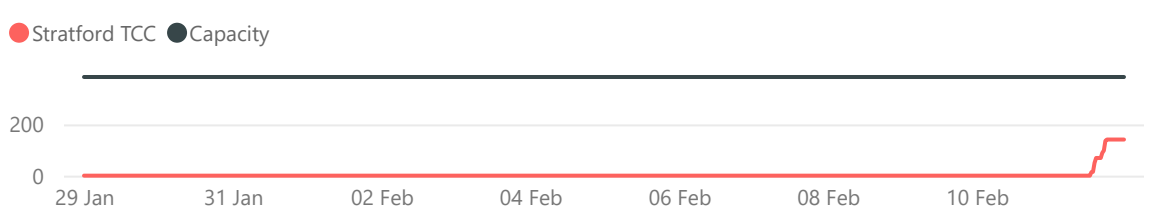
Other SI Hydro



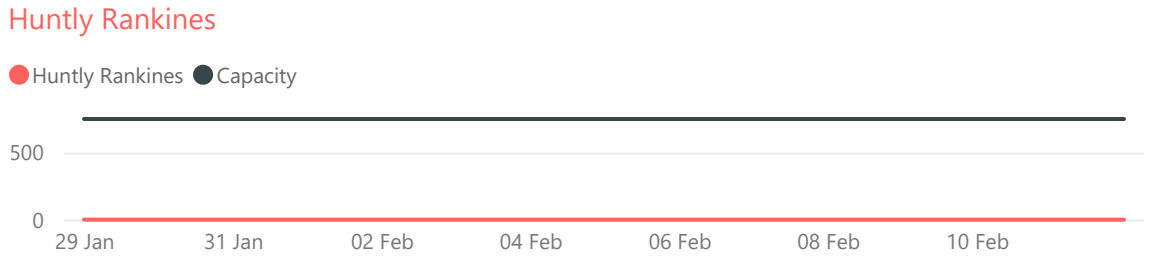
Thermal Peaking Plant



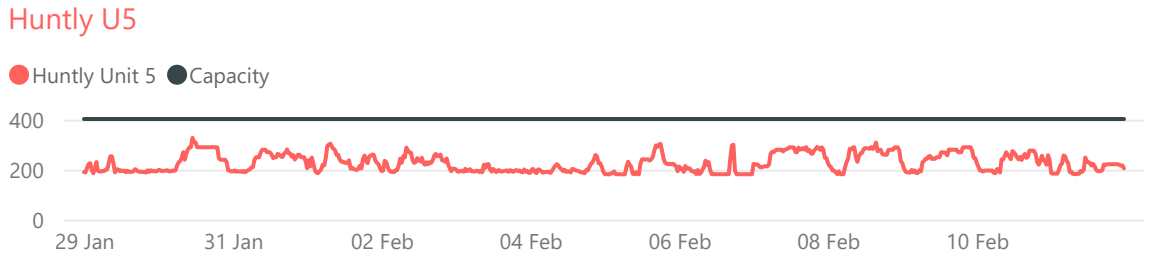
Stratford TCC



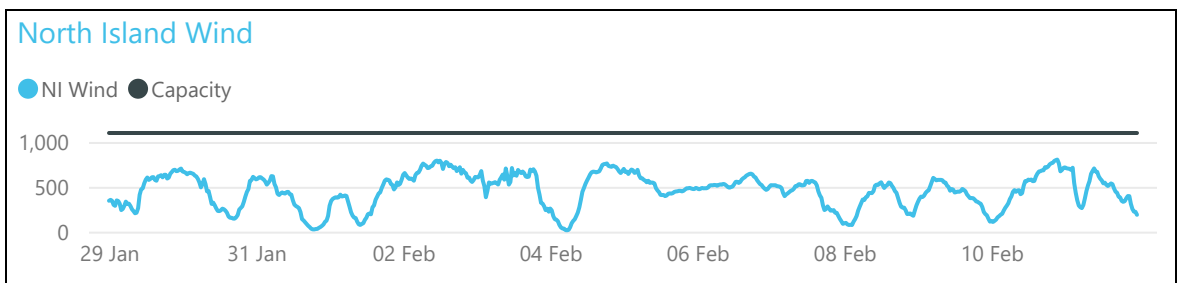
Huntly Rankines



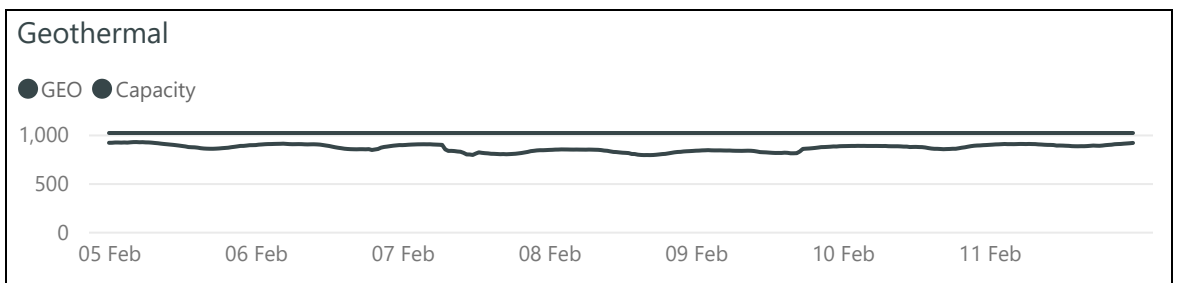
Huntly U5



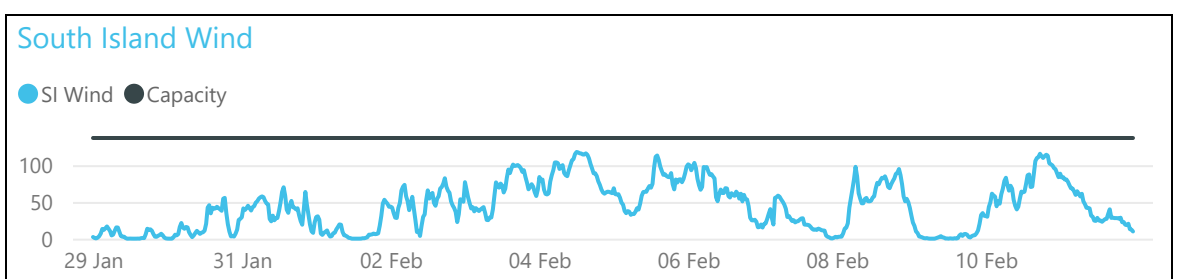
North Island Wind



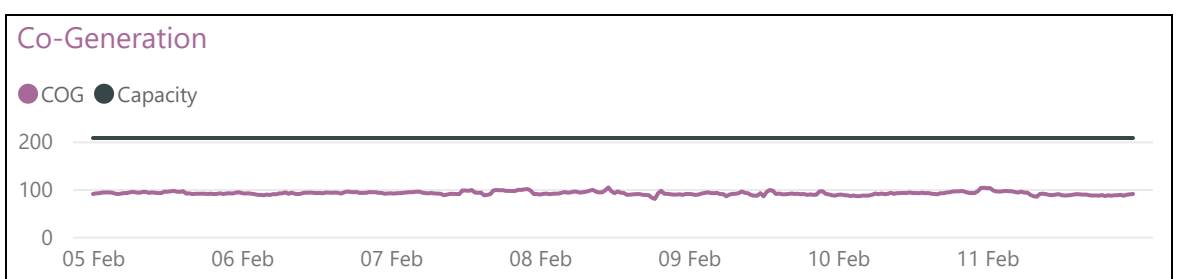
Geothermal



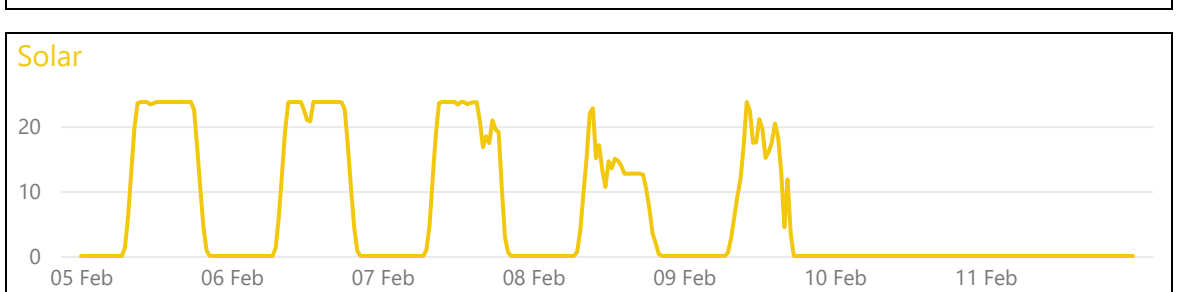
South Island Wind



Co-Generation

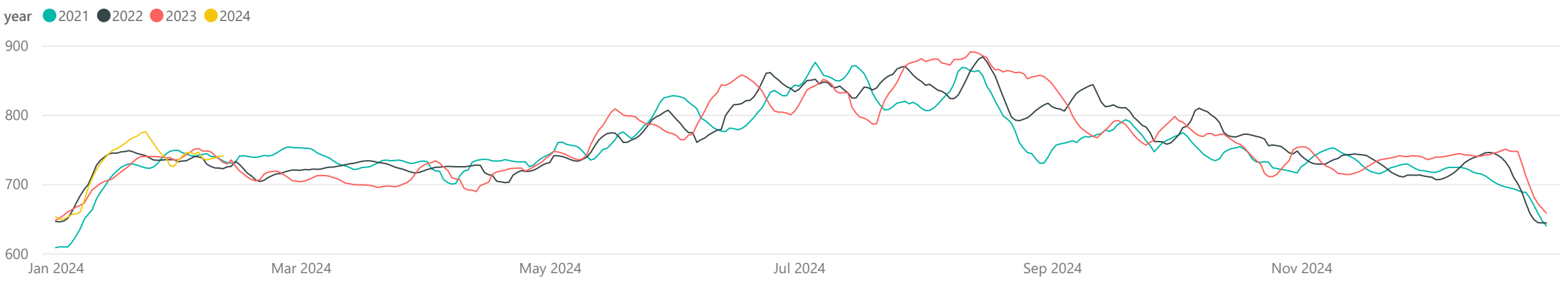


Solar

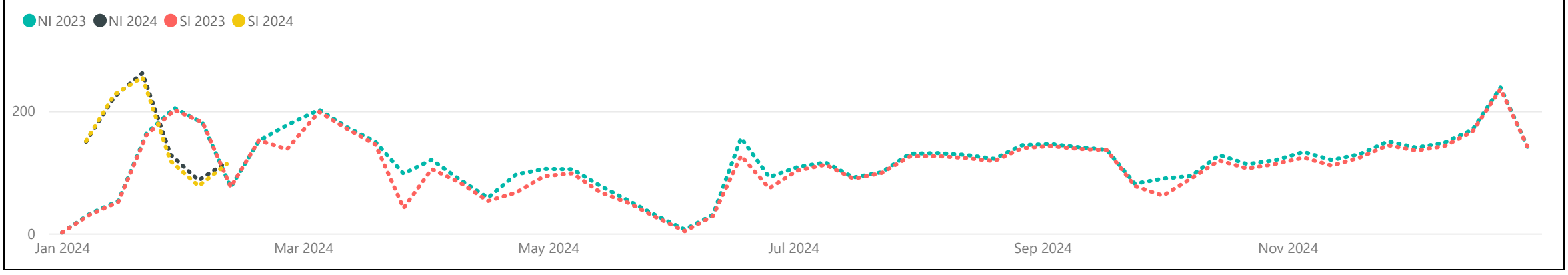


Weekly Profiles

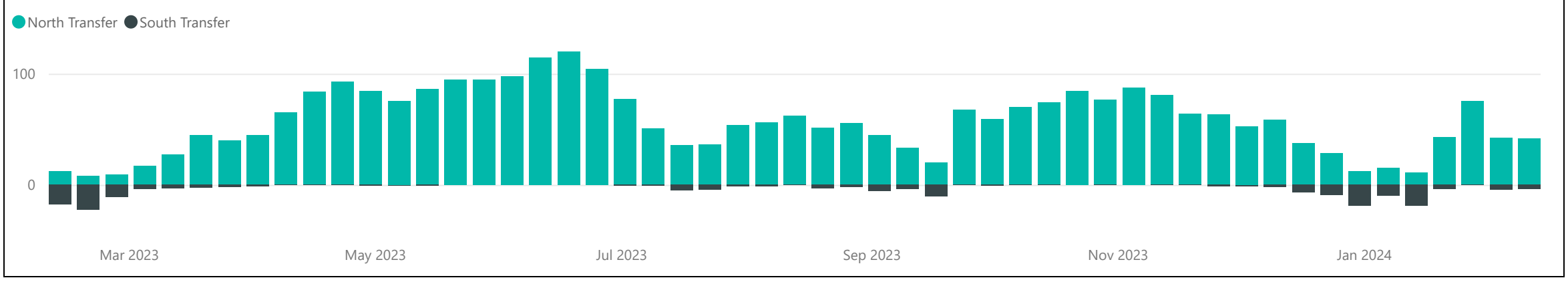
National Weekly Demand - GWh - 7 Day Rolling



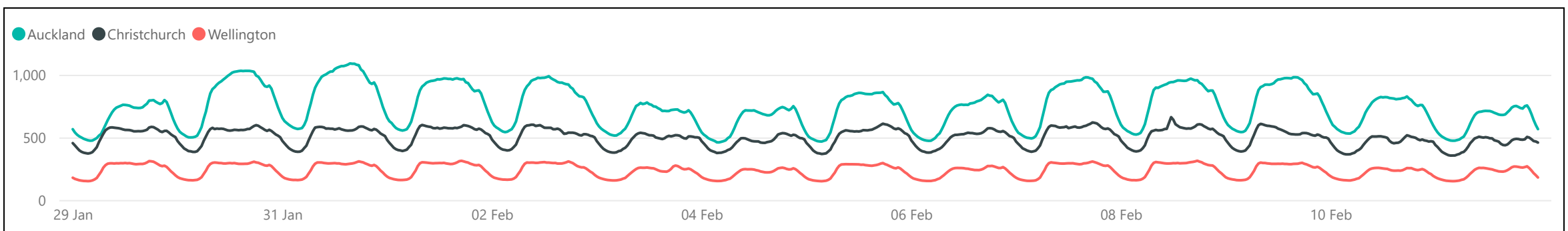
Weekly Spot Price - $/MWh



HVDC Transfer - Weekly GWh

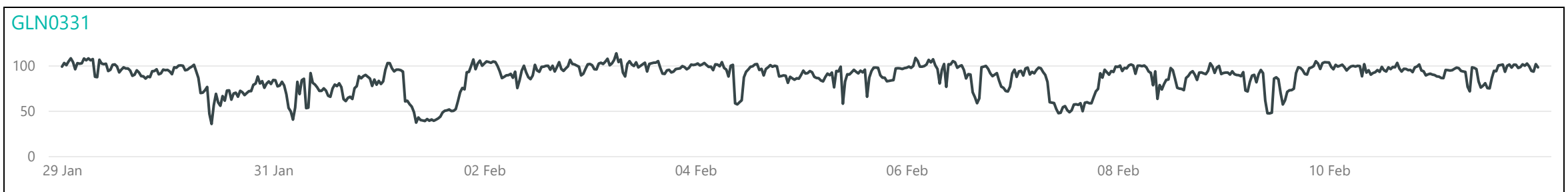


Conforming Load Profiles - Last Two Weeks *Measured in MW shown by region*



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

GLN0331



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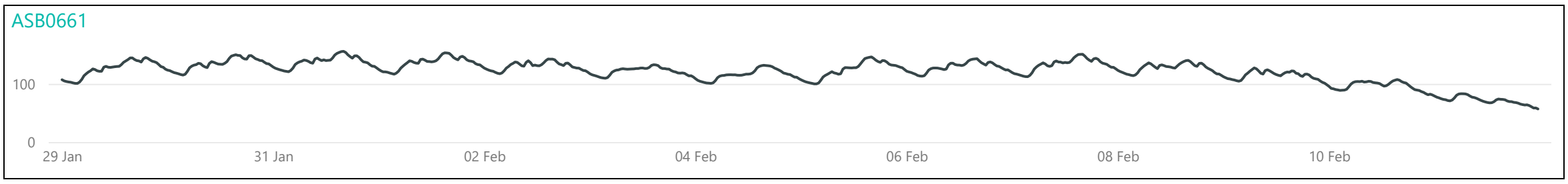

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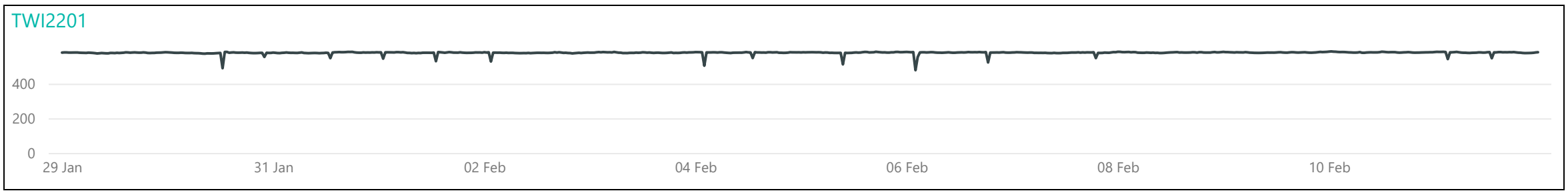
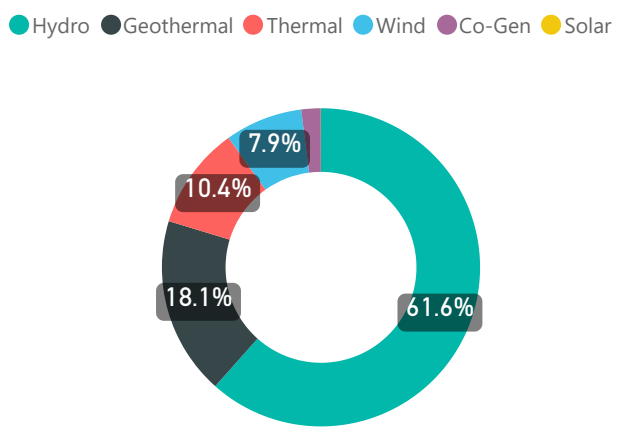


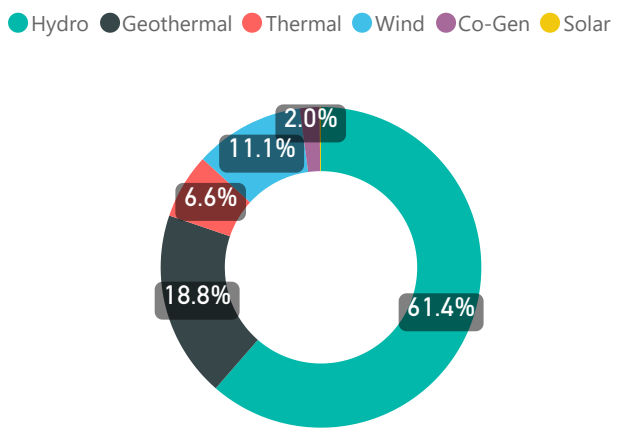
TRANSPOWER

Generation Mix

Last 52 Weeks Generation Mix - Weekly GWh



Last 7 Days Generation Mix - Weekly GWh



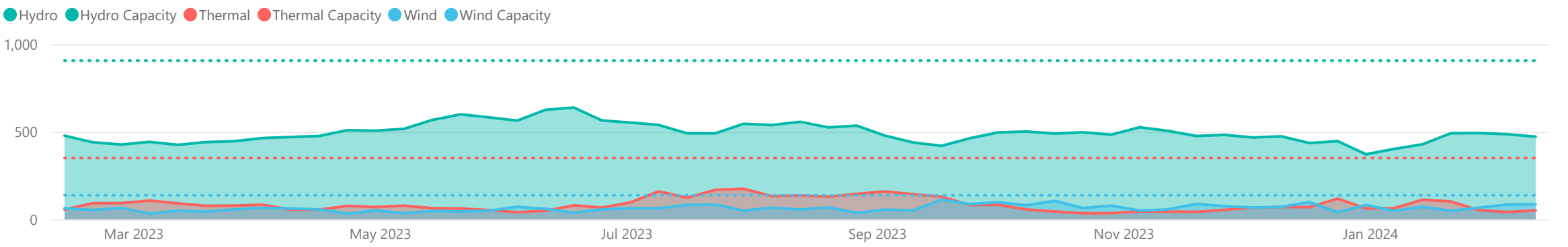
Average Metrics Last 7 Days

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
91%	35,211	46.0

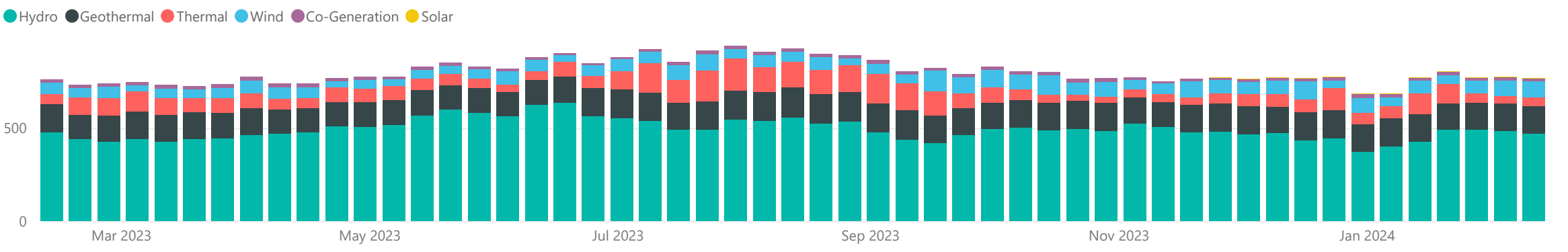
Average Metrics Last 52 Weeks

Renewable Percentage	CO2e Tonnes/Week	CO2e g/kWh
88%	59,906	73.6

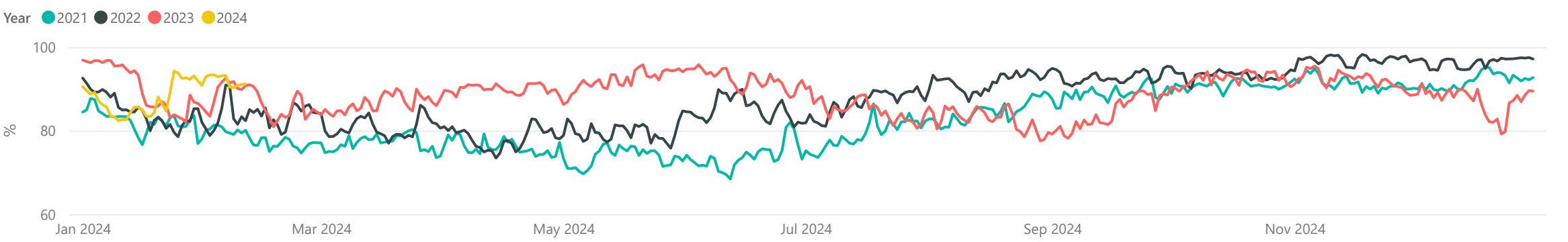
Weekly Generation Mix vs Capacity - GWh



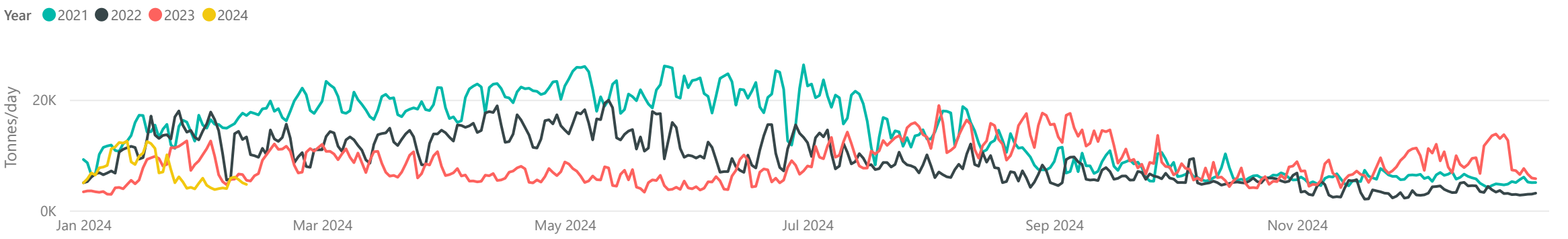
Weekly Generation Mix - GWh



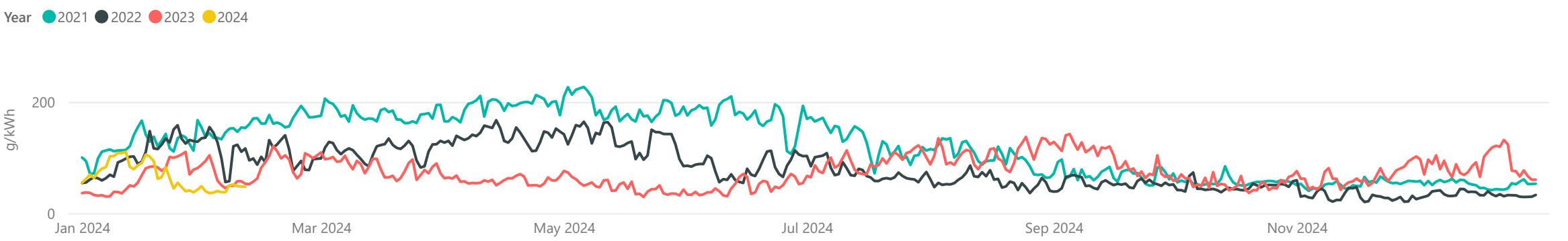
NZ Renewable Percentage



CO2 Tonnes/Day

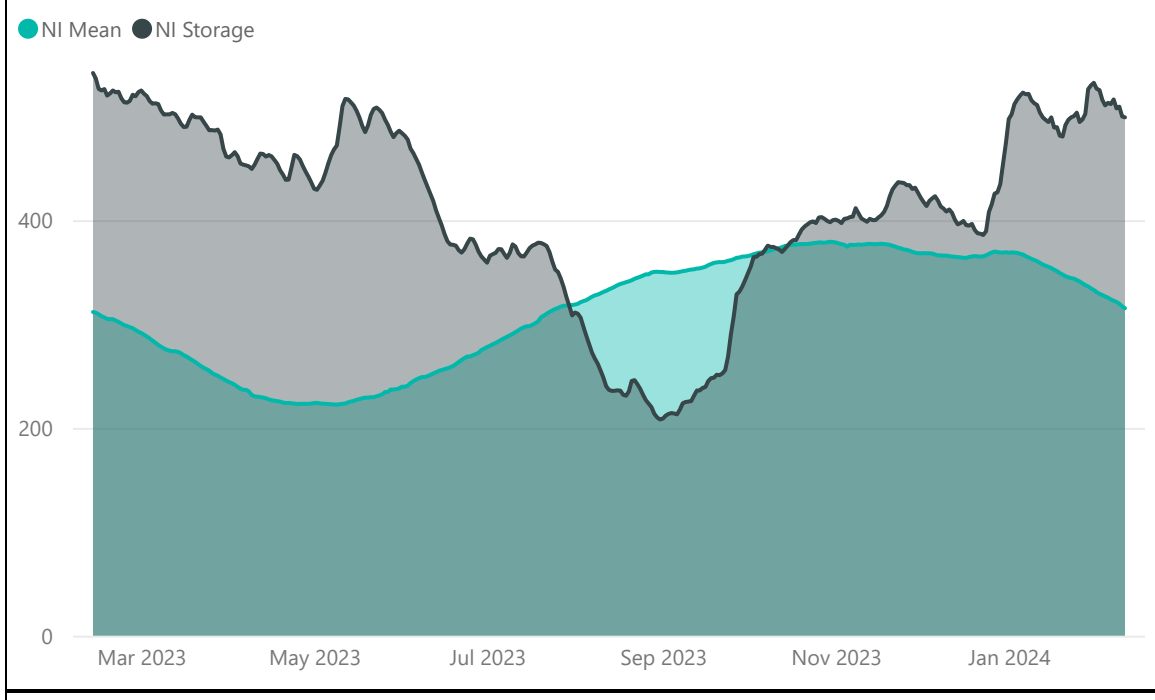


CO2 g/kWh

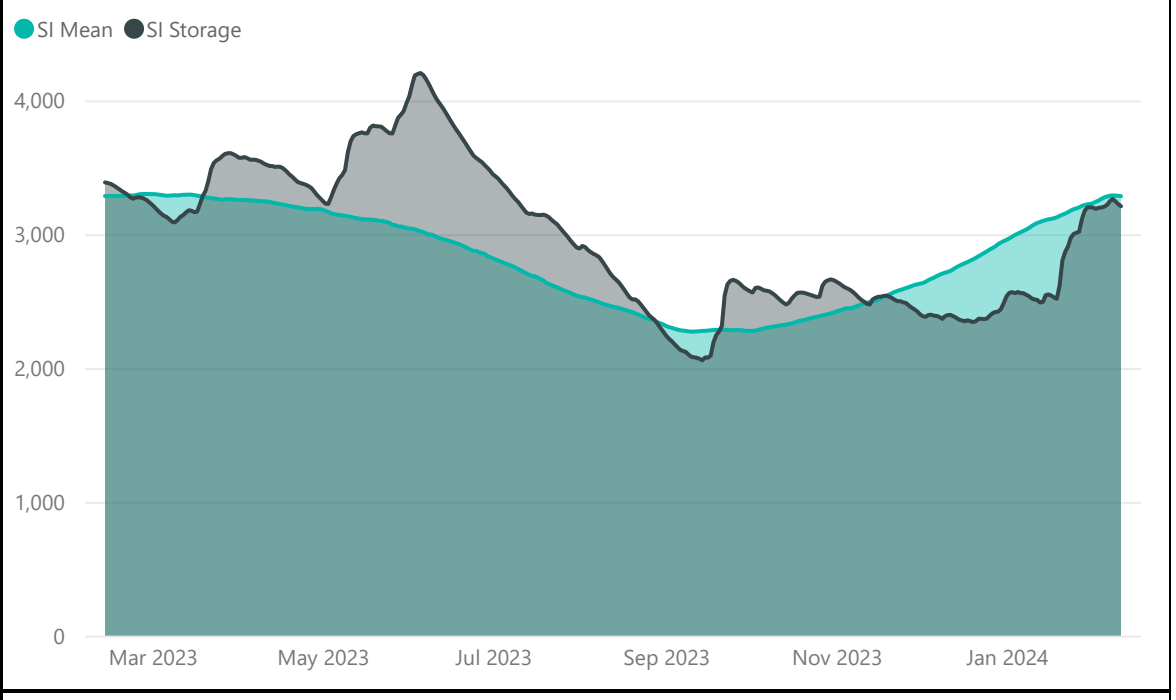


Hydro Storage

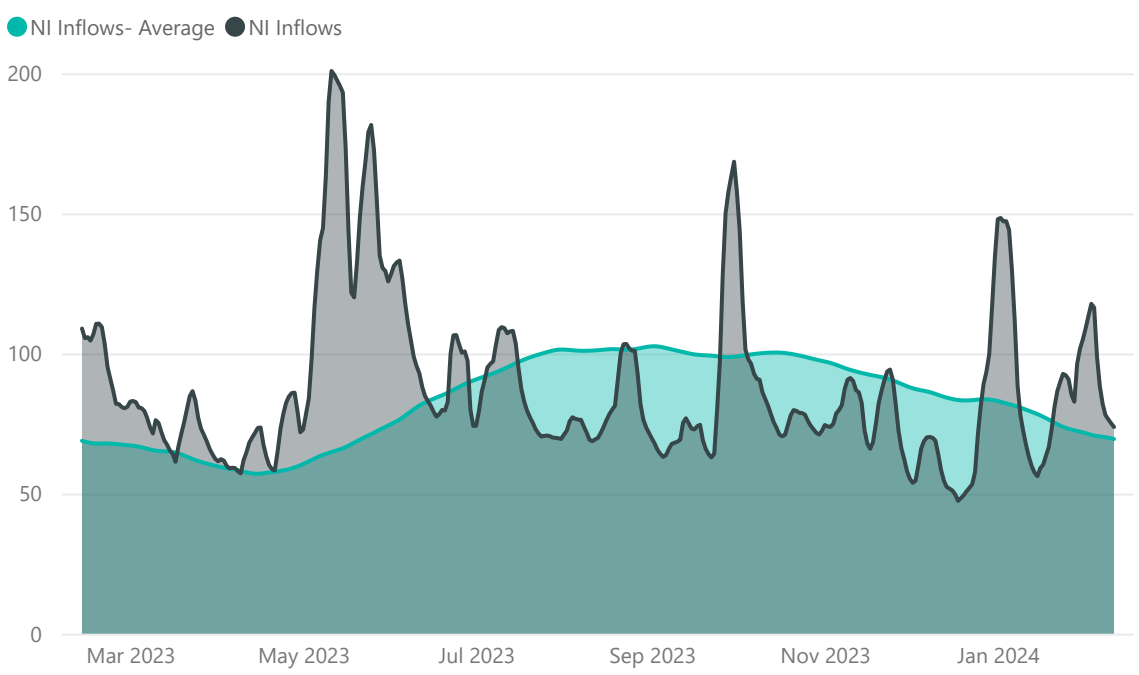
North Island Hydro Storage (Available GWh)



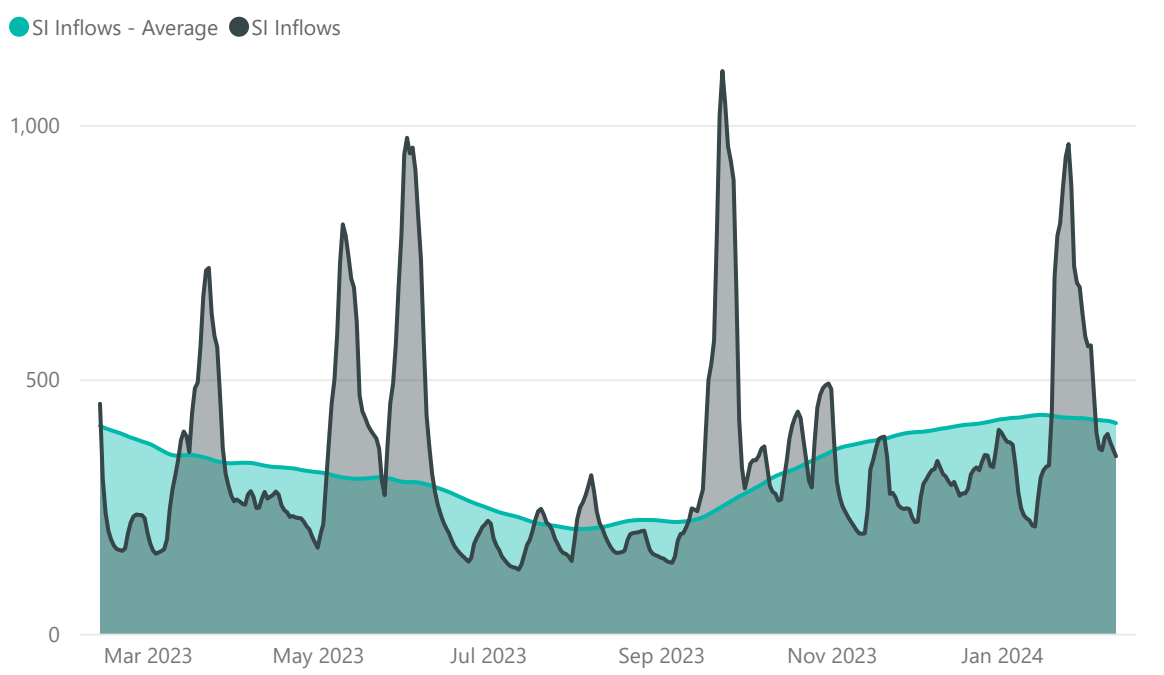
South Island Hydro Storage (Available GWh)



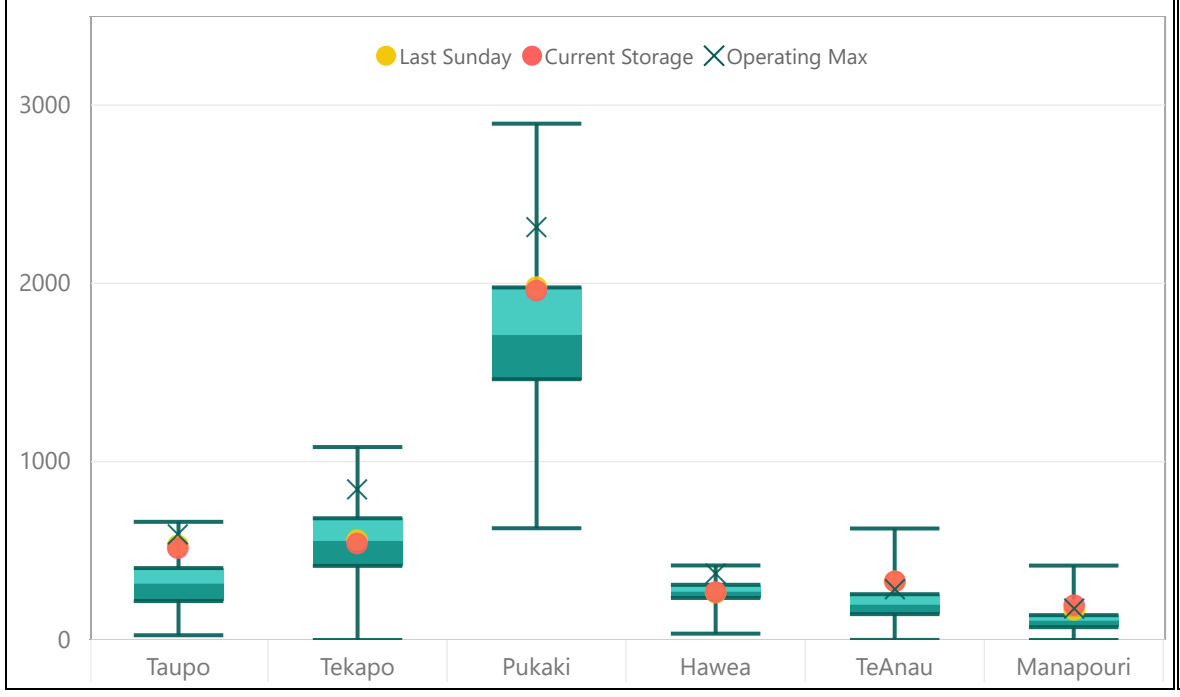
North Island Mean 7 Day Inflows (Available GWh)



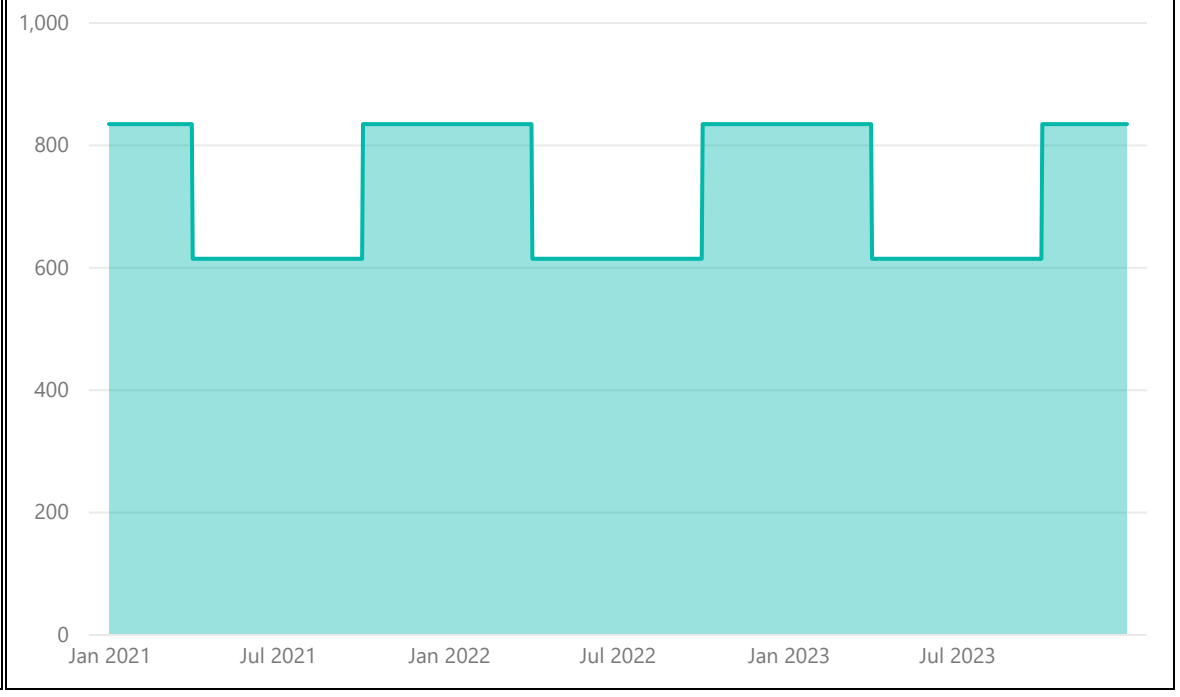
South Island Mean 7 Day Inflows (Available GWh)



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

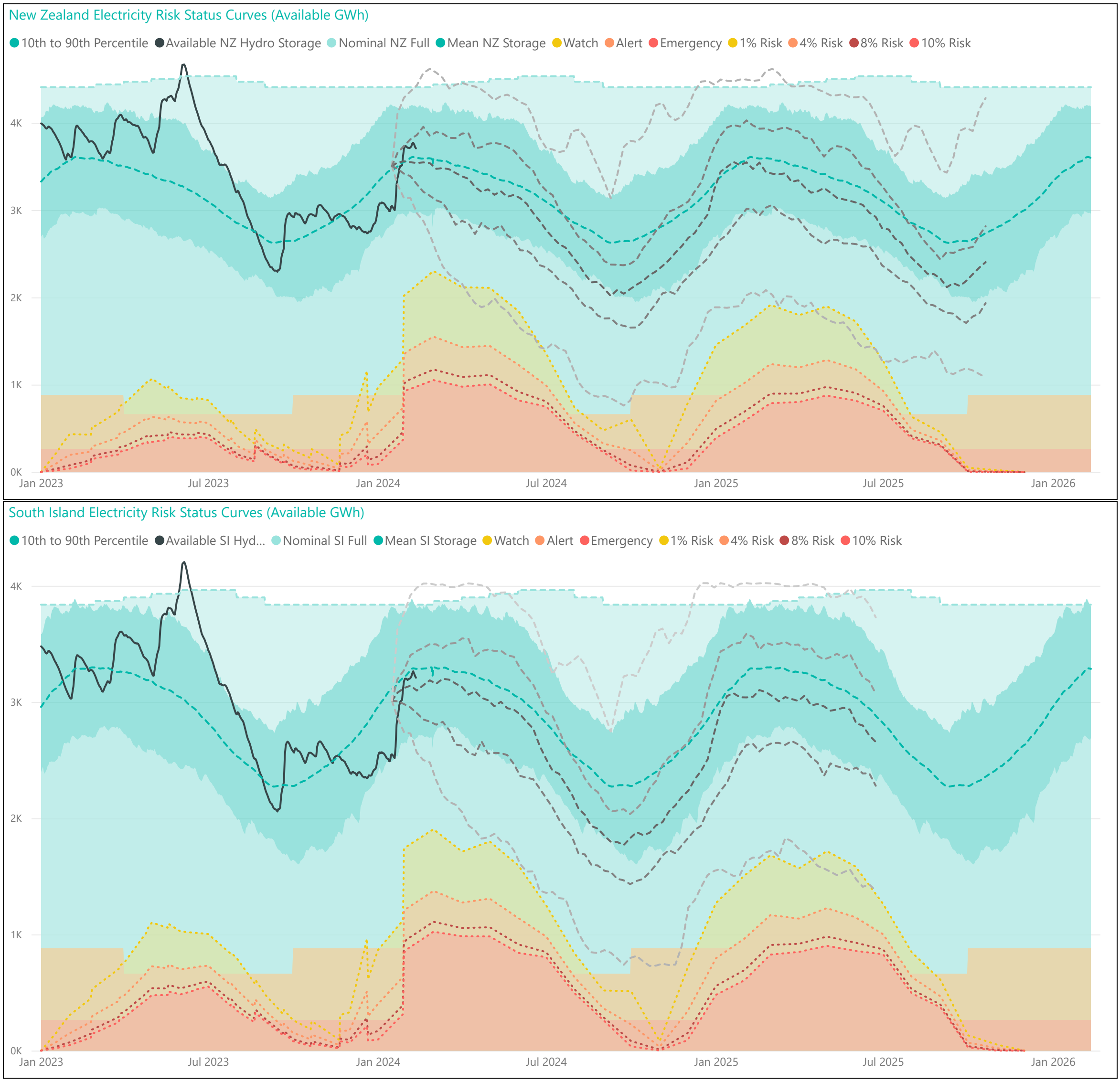
For any inquiries related to security of supply contact market.operations@transpower.co.nz

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

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).