TRANSPOWER

System Operator Industry Forum

22 July 2025

Today’s agenda

Market and Operational updates

- Key messages
- Market update
- Operational update
- NZGB update
- Grid Owner’s Redclyffe Transformer Project
- Consultations, publications and events

Key Messages

- Nationally hydro storage is now above mean. South Island storage remains below mean.
- Temperatures are dropping and Winter load is picking up, there will be times we are relying on slow start thermal units to meet high peak demand – particularly during any cold snaps.
- Continued focus on asset availability is needed to reduce energy and capacity risk this winter.

Market update

Energy: National hydro storage

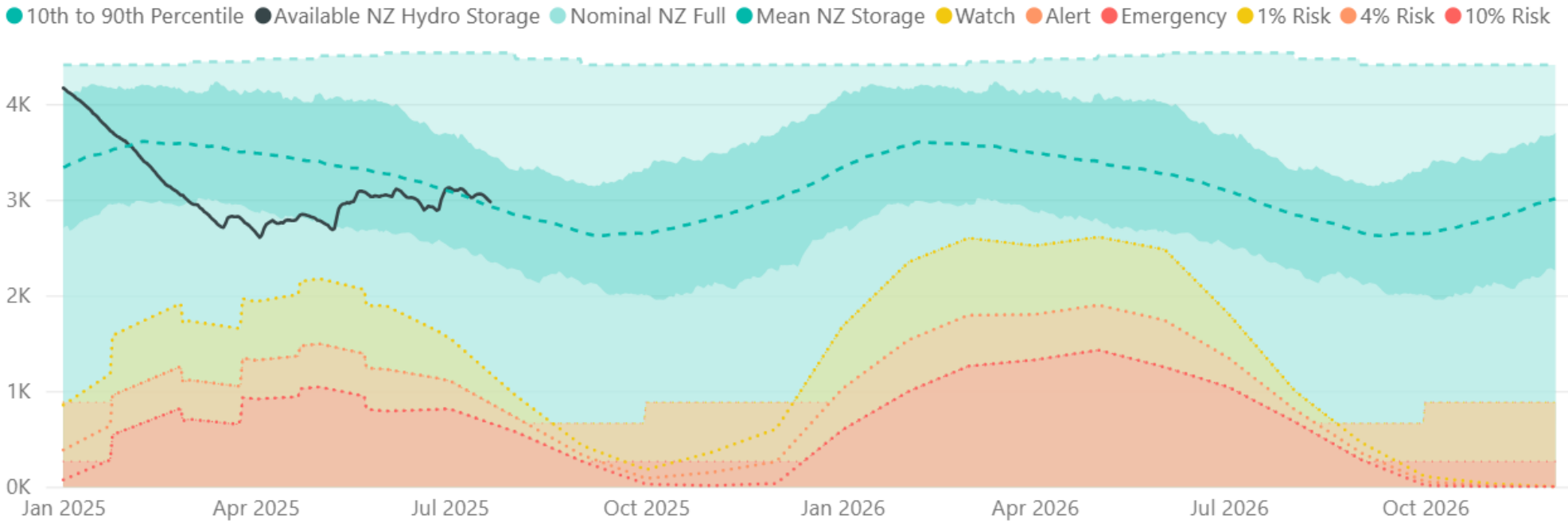
National hydro storage remains about average for this time of year.

	Hydro storage level (% of mean ▲/▼)		
	New Zealand	South Island	North Island
Last forum	102%	95%	171%
Now	101% ▼	95%	154% ▼

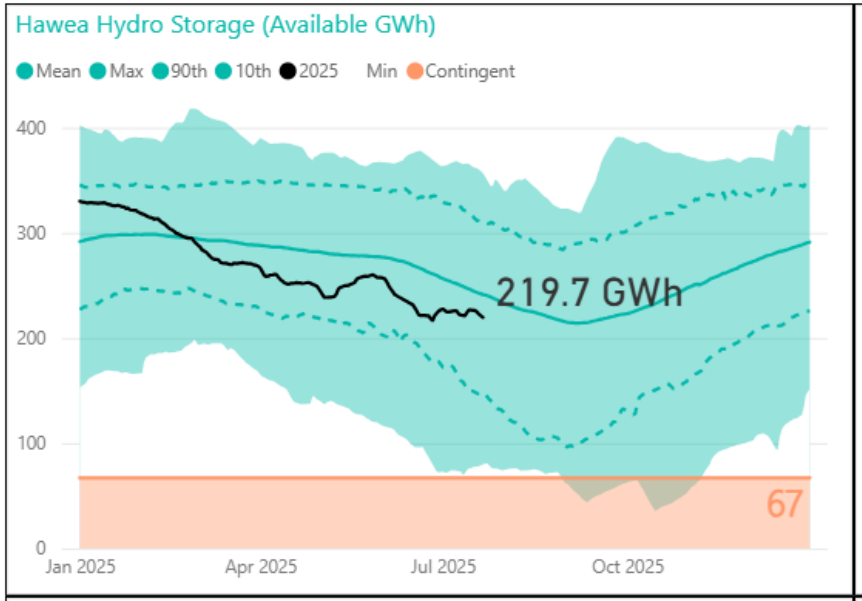
New Zealand Energy Risk

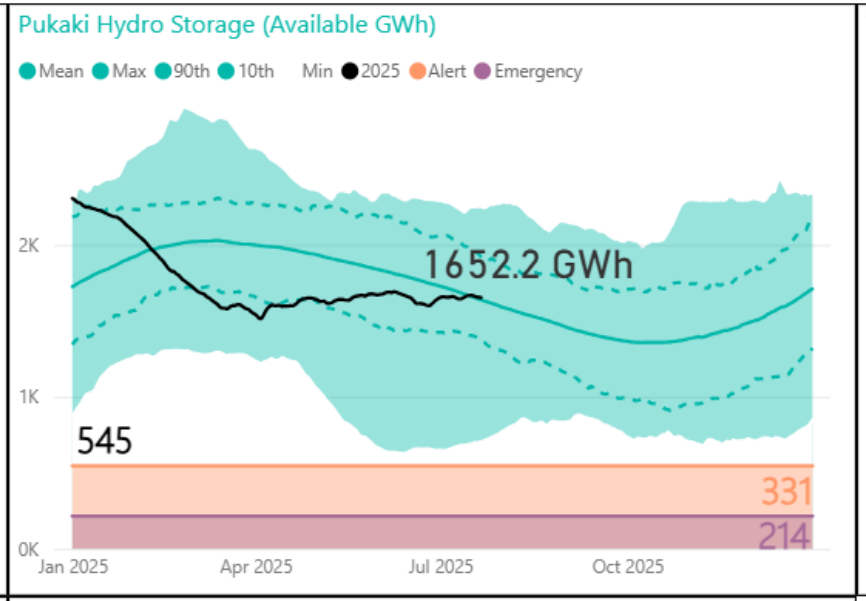
South Island Energy Risk

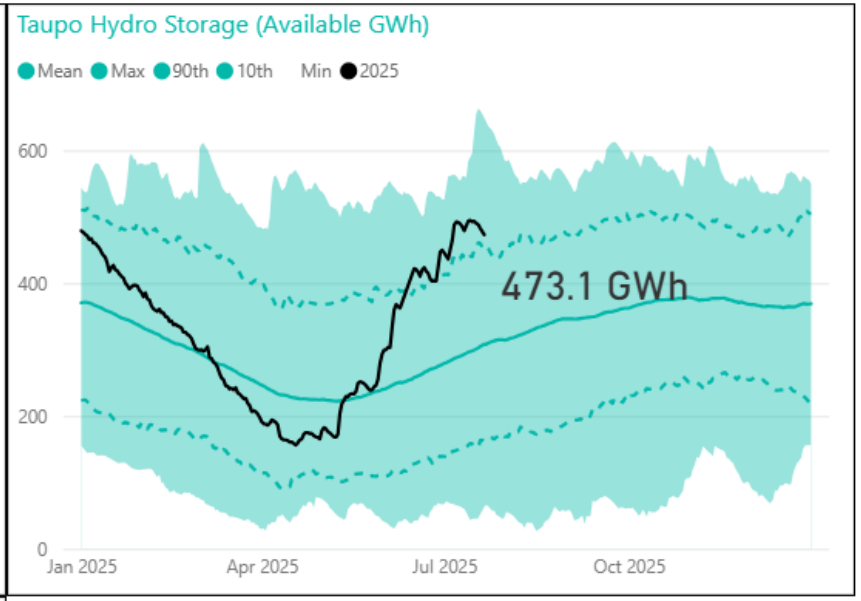
New Zealand Electricity Risk Status Curves (Available GWh)

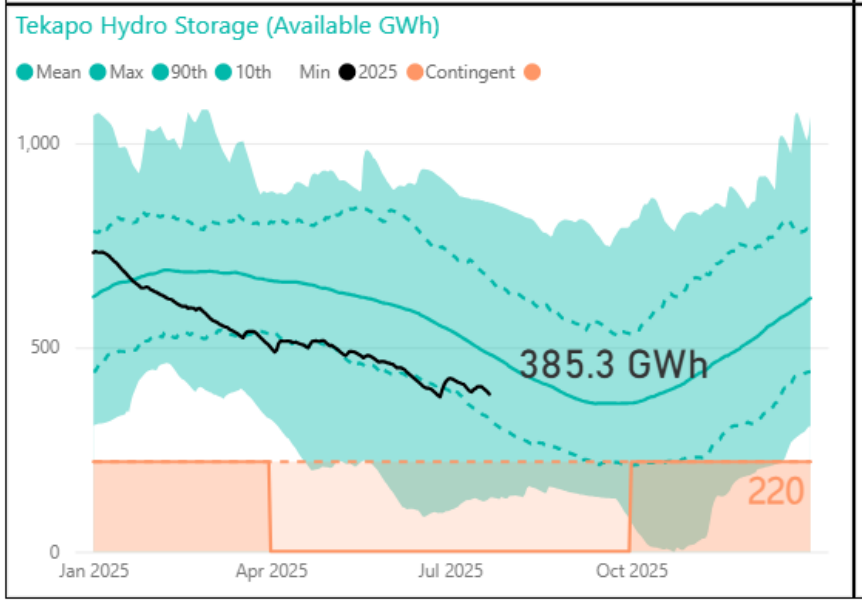


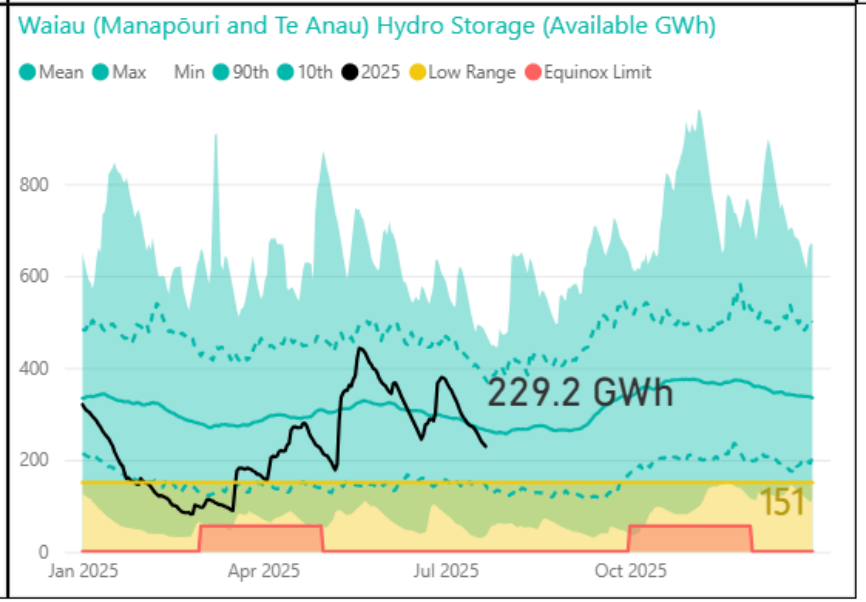
Hydro storage by catchment







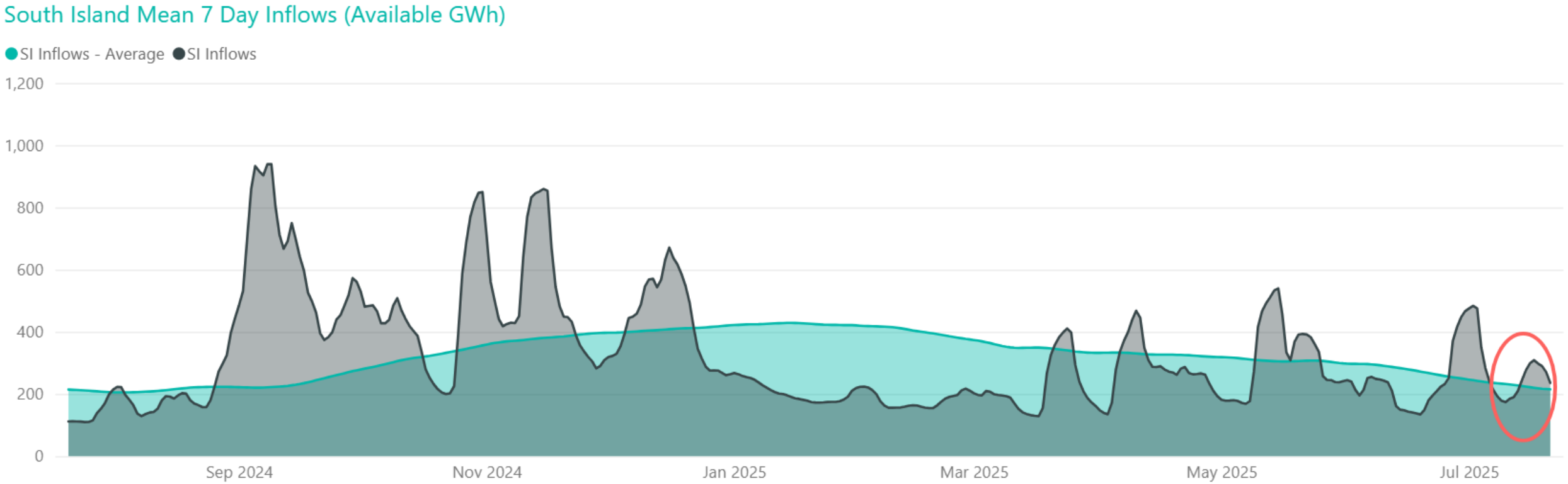


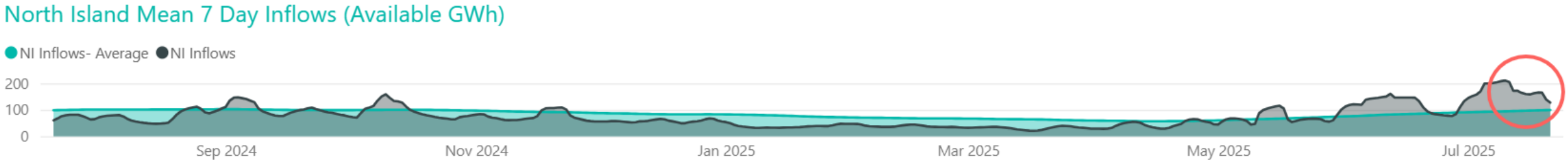


Lake	Current (%) avg
nz_controlled	101
si_controlled	95
hawea	91
pukaki	101
manapouri	75
te_anau	93
tekapo	80
taupo	154

Hydro inflows

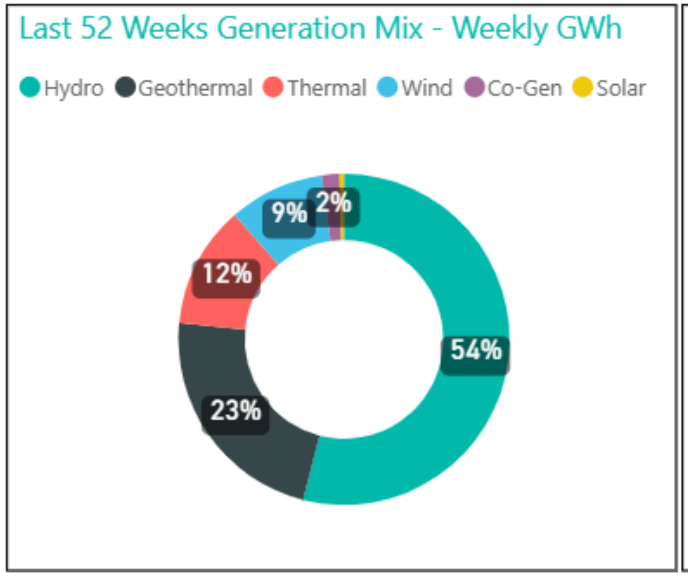
Roughly average SI inflows, strong NI inflows

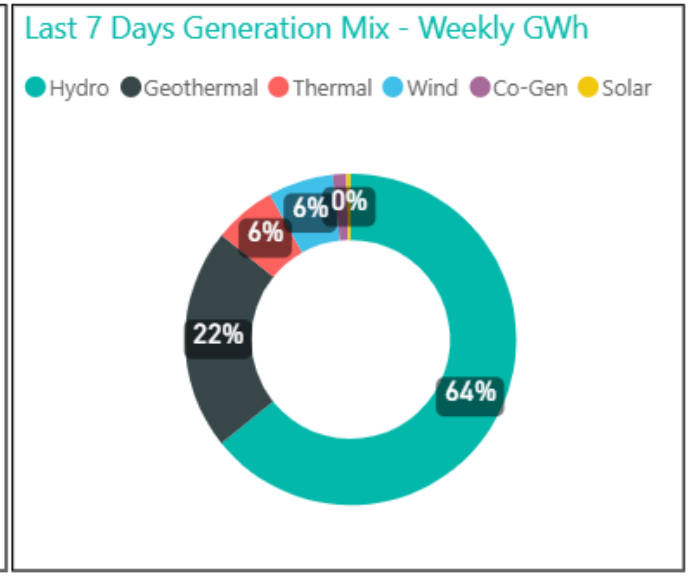


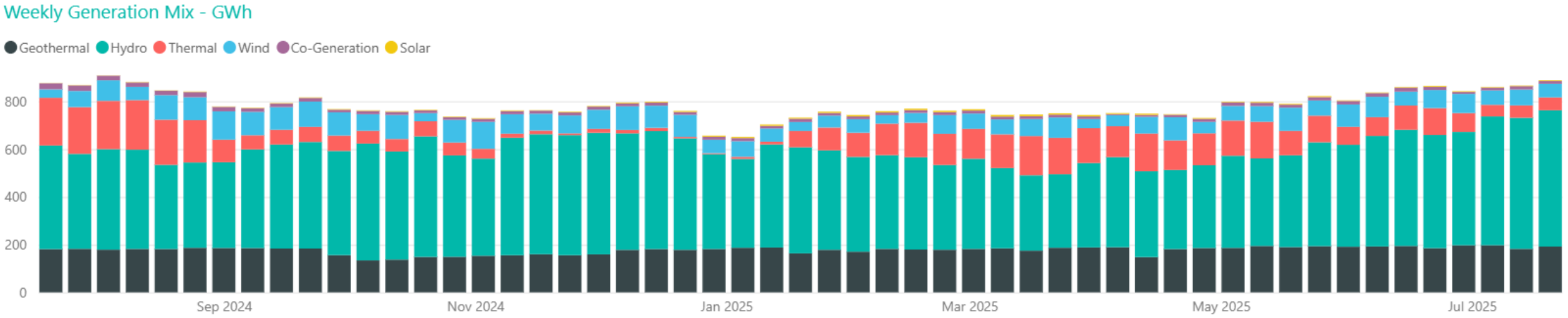


Generation mix

- Hydro generation remains high, supported by strong North Island inflows.
- Low thermal share with low average prices.
- Wind contribution less than average at 7% of the mix.

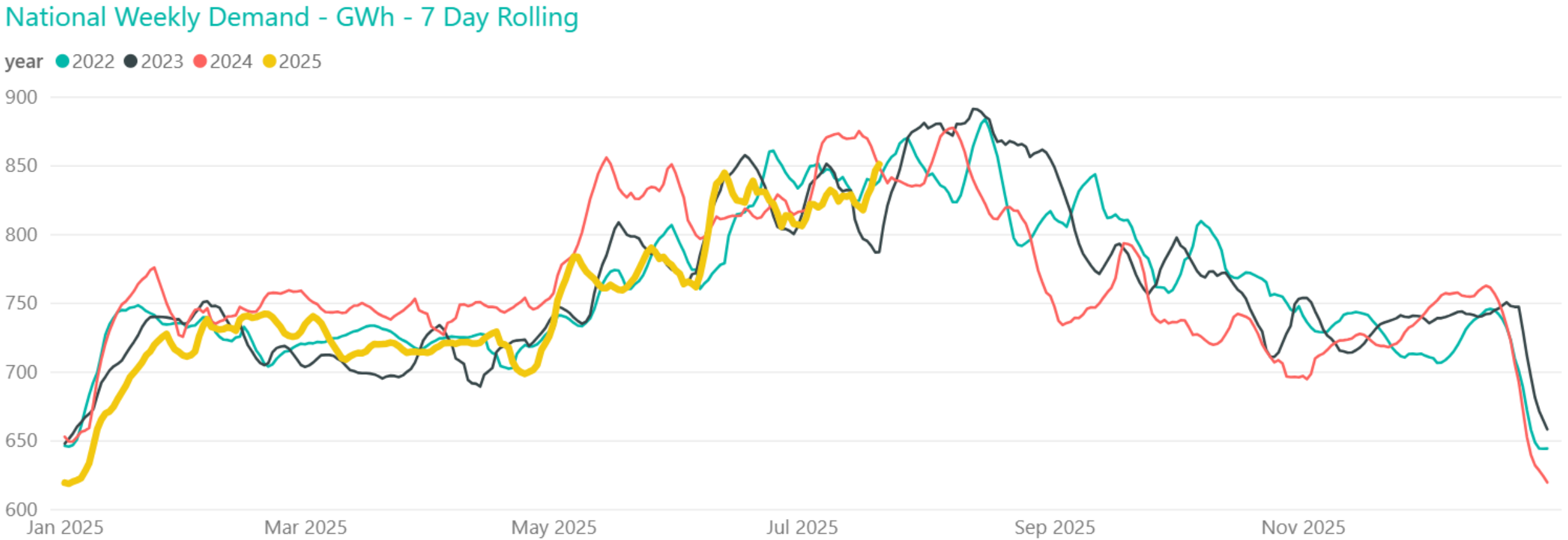






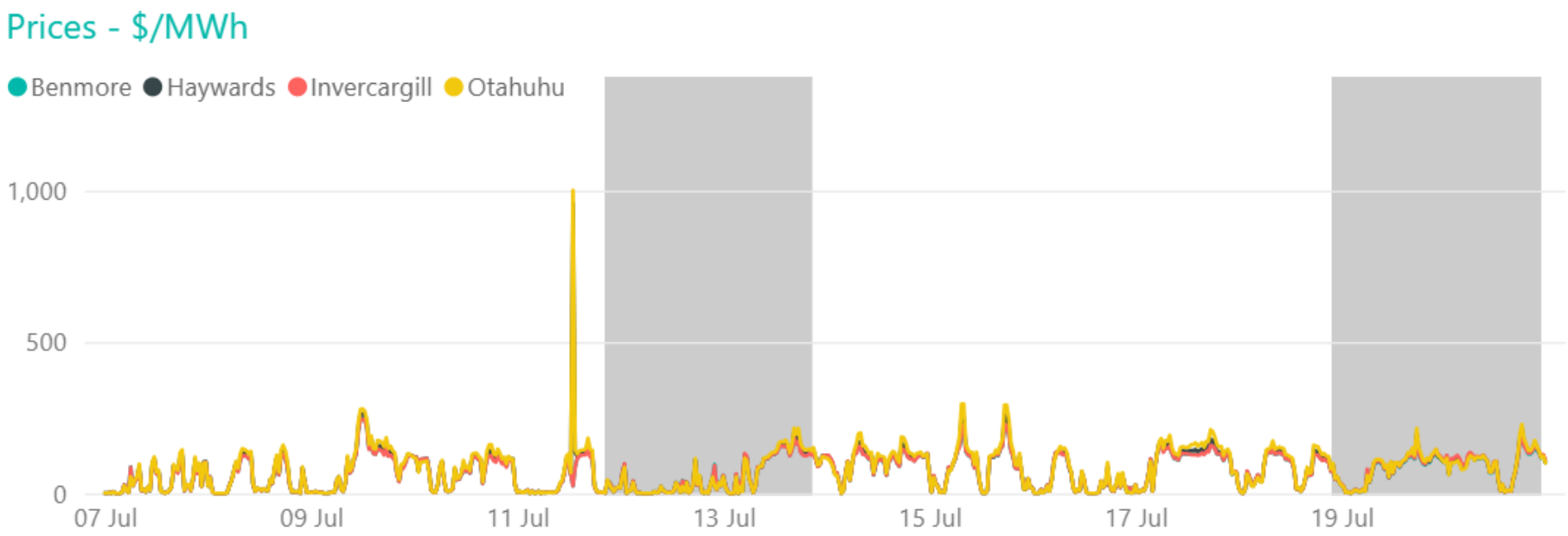
Demand

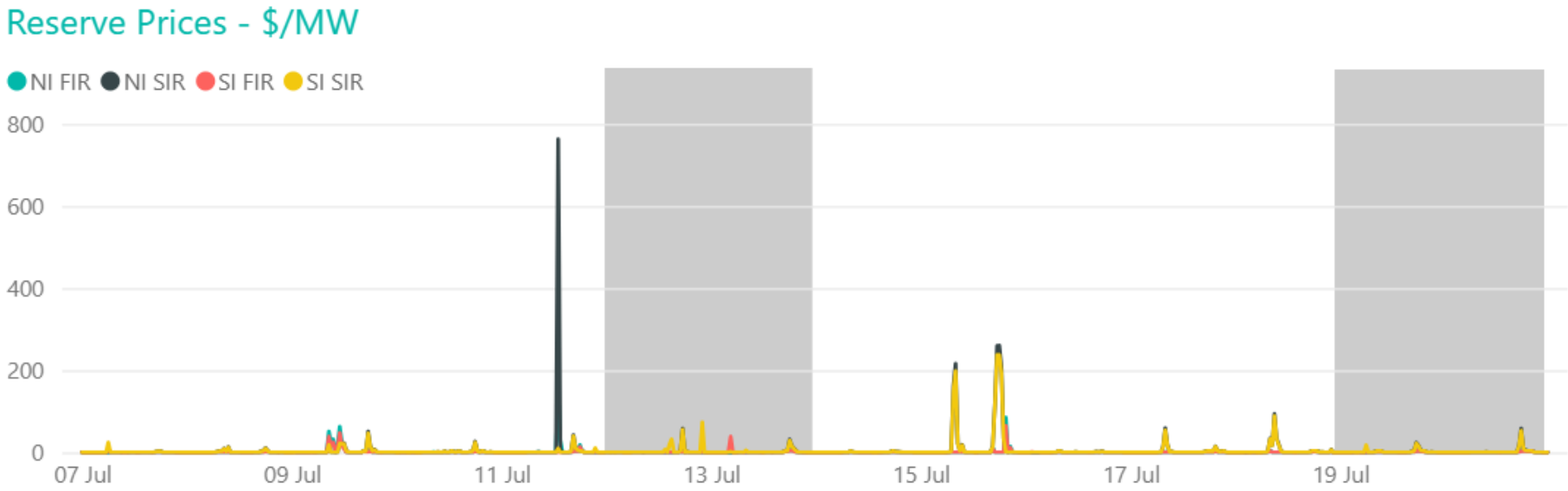
- Demand has increased since the previous forum.
- Temperatures dropped last week, but remained mild-moderate for this time of year.
- 850 GWh last week, up from 829 GWh the week prior.



Pricing

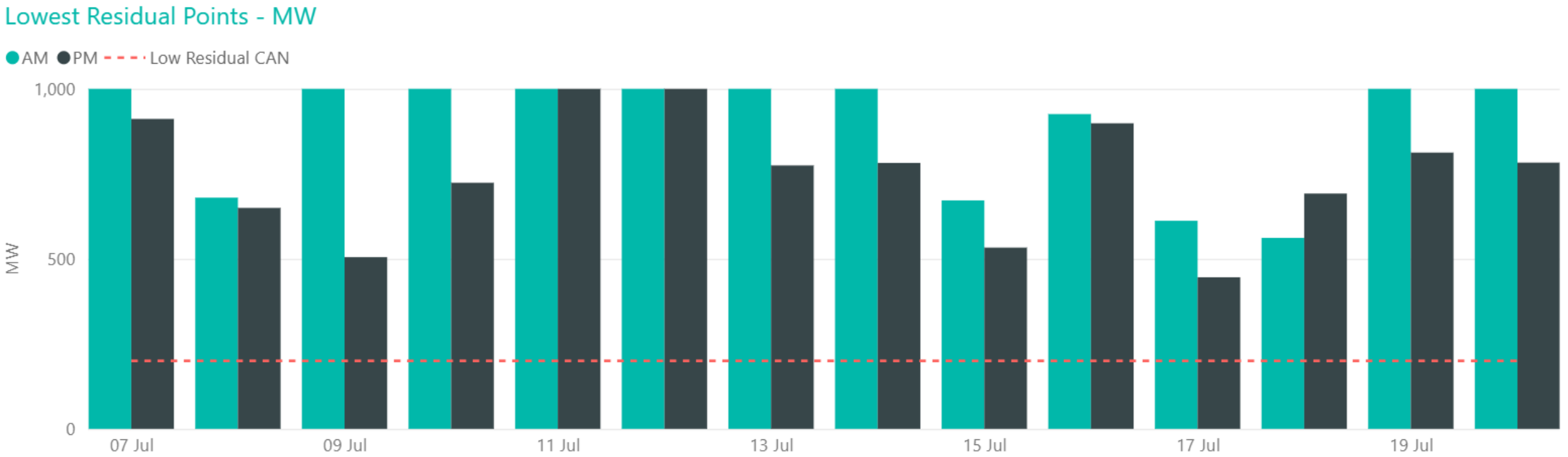
- Average Ōtāhuhu price was $95/MWh last week, and $67/MWh the week prior.
- An under-frequency event occurred on Thursday 11 July at 1:04 pm. The Ōtāhuhu price peaked at $1,001/MWh with constrained HVDC transfer.





Capacity residual margins

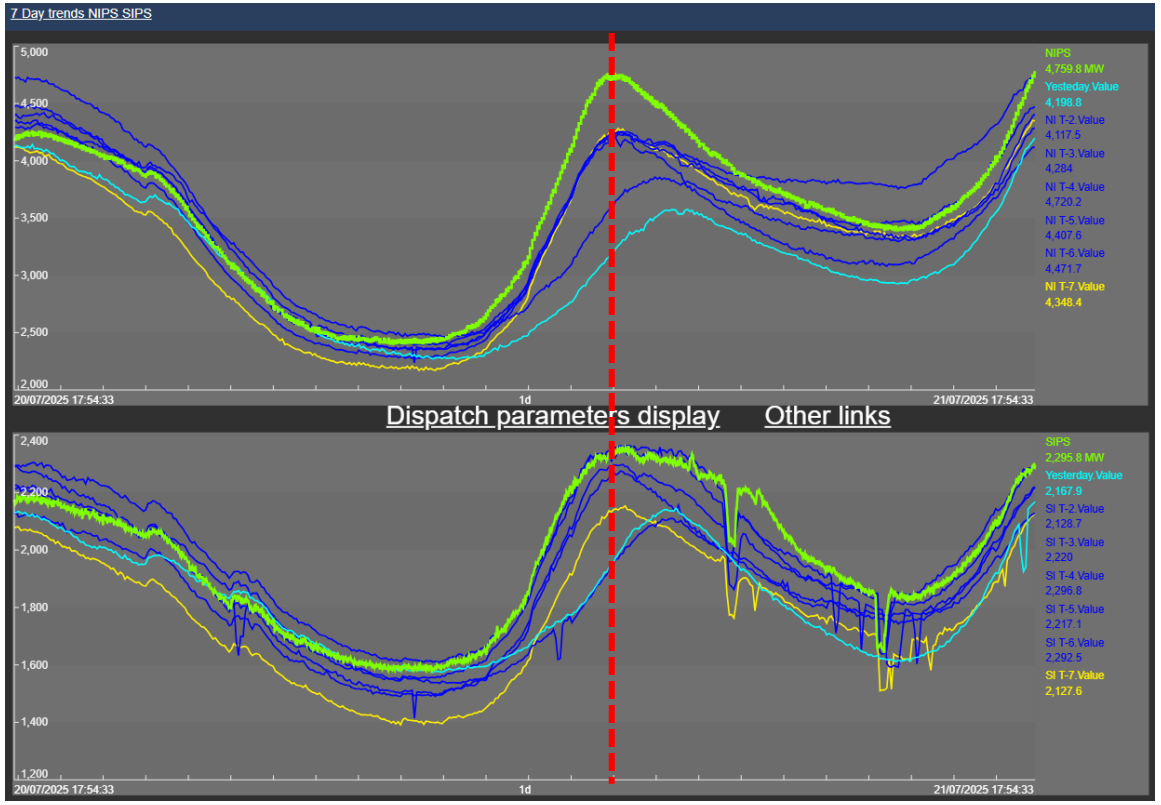
- Residuals have been dropping with colder temperatures and sometimes low thermal unit commitment.
- Lowest residual (up to Sunday 20 July) was 446 MW on Thursday 17 July, coinciding with the highest load of the year up to that point.



Operational update

Morning Peak 21 July

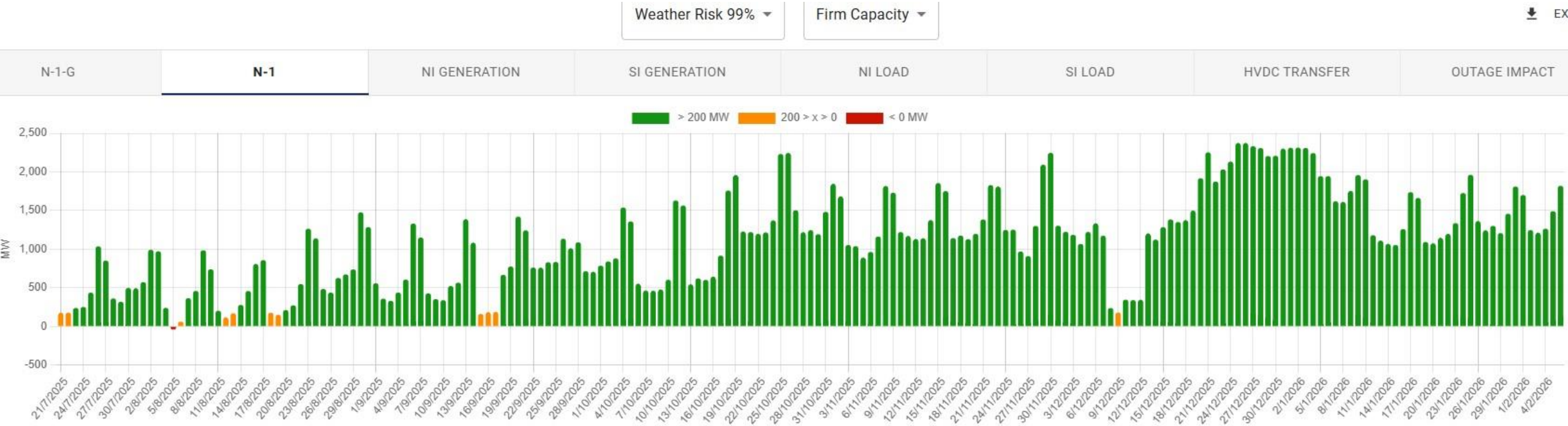
- Forecast residuals were above the low residual threshold throughout the previous day although reducing overnight to near the 200 MW threshold in the schedules.
- Residuals dropped below 200 MW at 07:35 with lowest residual being 65 MW at 07:45.
- Lower wind/higher load compared to forecasts, plus 44 MW's of generation had to Bonafide out prior to the peak.
- Discretioned on uncleared generation
- Control room prepared for a shortfall if it eventuated.



NZGB update

NZGB update: N-1 scenario

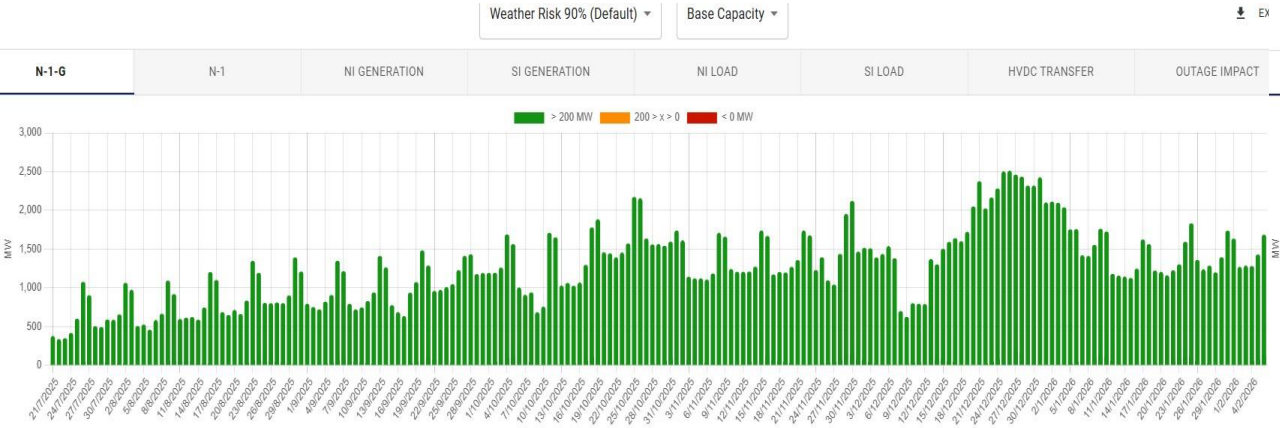
- The graph below indicates potential N-1 margins on a cold winter peak with slow starting thermal generation not offered in
- Within 7 days please look at the WDS schedules



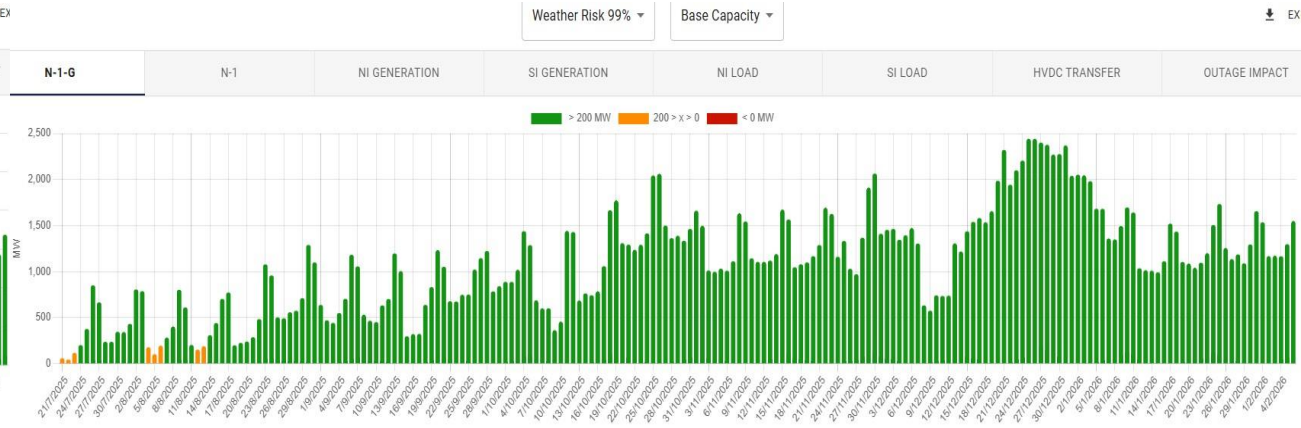
NZGB update: base capacity N-1-G

- N-1-G margins are currently showing healthy values
- Under the 99th percentile load, which we would expect under a winter cold snap, the margins drop to low values close to zero

Base case capacity at 90%
- ***This triggers the CAN process***
- Assumes all generation available in POCP is offered
- It uses 20% of total wind capacity



90th percentile load

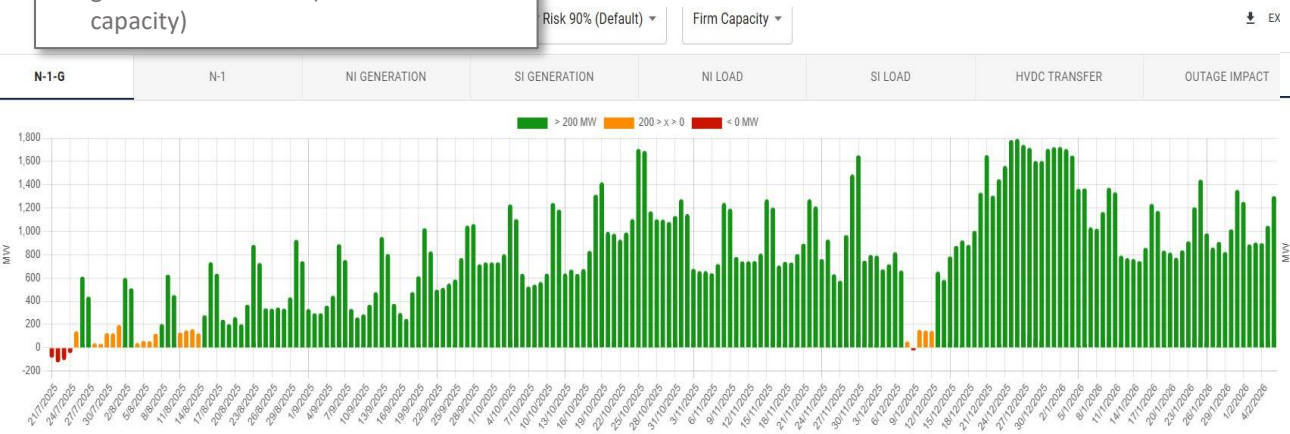


99th percentile load

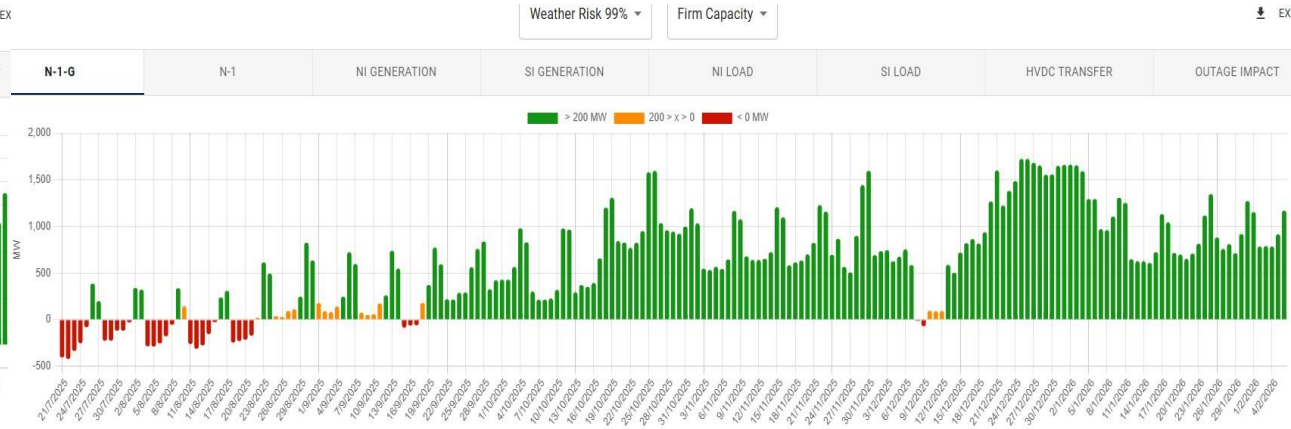
NZGB update: firm capacity only N-1-G

- Firm capacity scenario reflects units that historically operate for at least 90% of AM & PM peaks
- The potential shortfalls and low margin periods highlight the potential reliance on these units to be available to cover N-1-G
- This means we are relying on the market to coordinate especially slow starting thermal units, to get through peak load periods

Firm capacity removes
- TCC (-360MW) all months,
- 1 HLY Rankine over winter months June to November, and 2 Rankines over the remaining months
- It uses the lowest 10th percentile generation for wind (8% of total capacity)



90th percentile load



99th percentile load

NZGB update: recommendations

Recommendations from SO:

- Avoid further outages on periods with low margins
- Market coordination is required from industry to ensure available generation capacity remains high to cover potential cold snaps
- Keep POCP updated with scheduled or tentative outages
- Keep the WDS up to date with the latest offers
- Any other information on plant availability, please get in touch with SO

Redclyffe Transformer Project Update

Redclyffe Substation

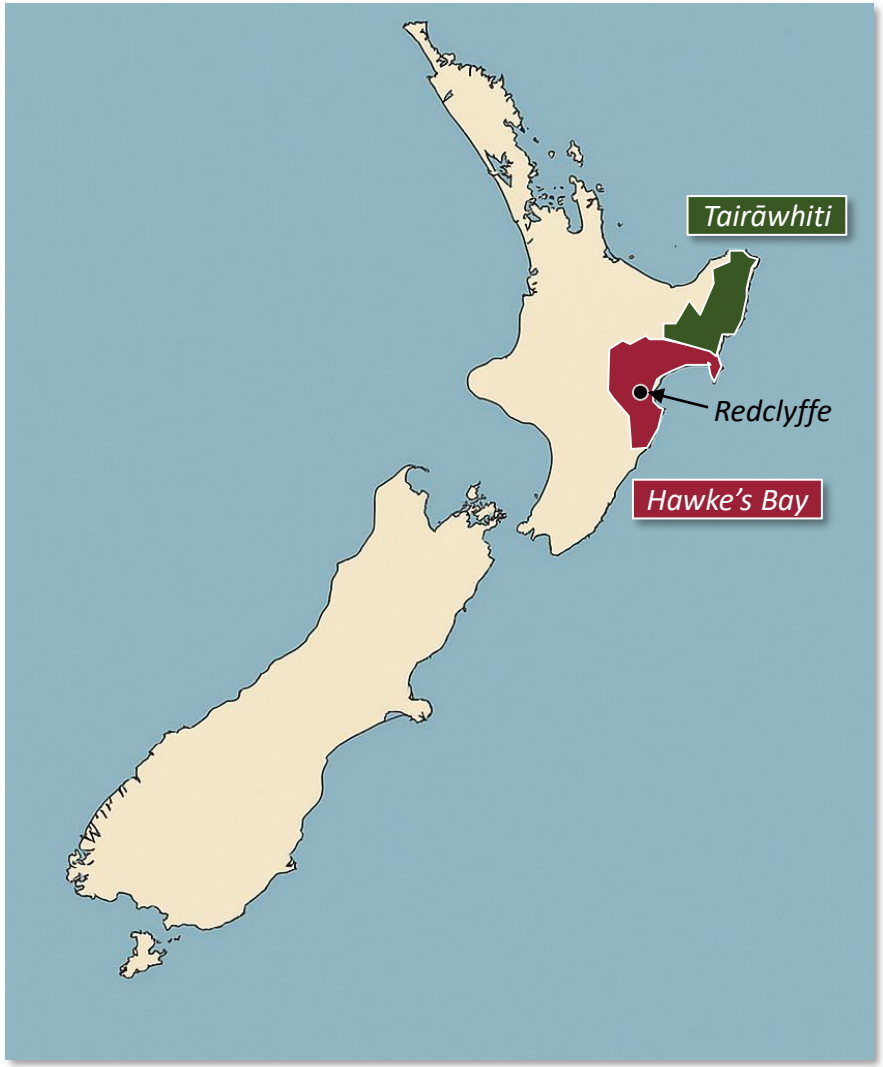
Redclyffe (RDF) substation supplies the Hawke's Bay and Tairāwhiti regions.

It supplies Redclyffe, Fernhill, and Tuai GXPs.

RDF is getting a brand new interconnecting transformer, **RDF_T5**.

This new transformer will increase resilience and capacity into the Hawke's Bay and Tairāwhiti regions.

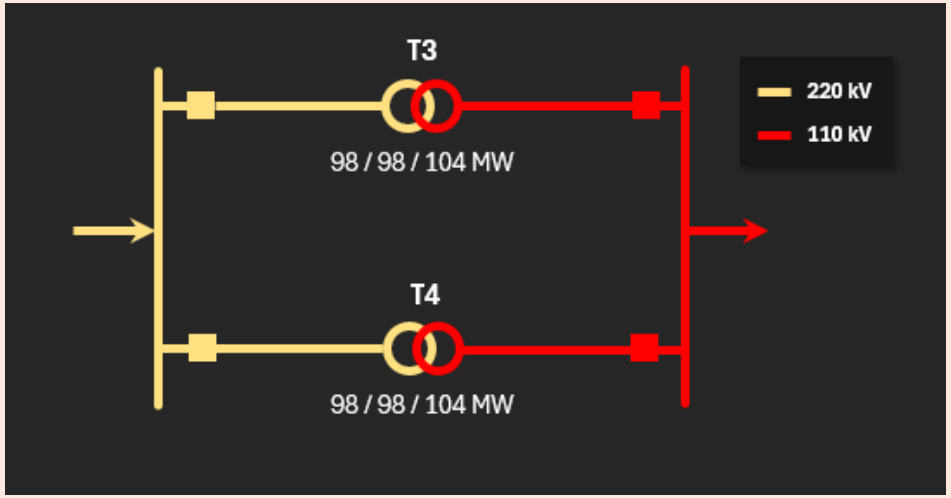
Expected project completion: **9th September 2025**



Configurations and ratings

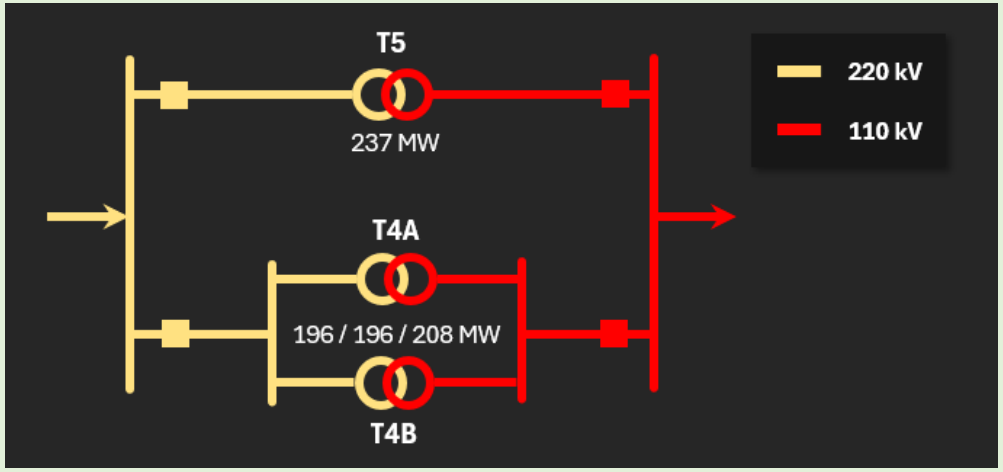
Existing

- 2 interconnecting transformers, T3 and T4.
- Seasonal ratings = 98 / 98 / 104 MW each.
- Total RDF capacity = **130 MW** for protection reasons.



Future

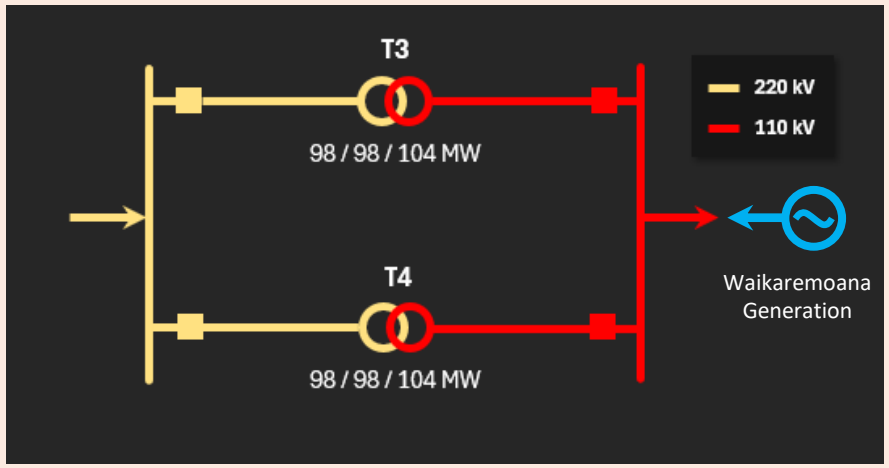
- **T5** has the rating of 237 MW, and will be installed where T3 currently is located.
- T3 will be relocated next to T4.
- T4 and T3 will be renamed as T4AB.
- Total RDF capacity = **220 MW** for protection reasons.



Special Protection Scheme (SPS) and Permanent Manual Constraint

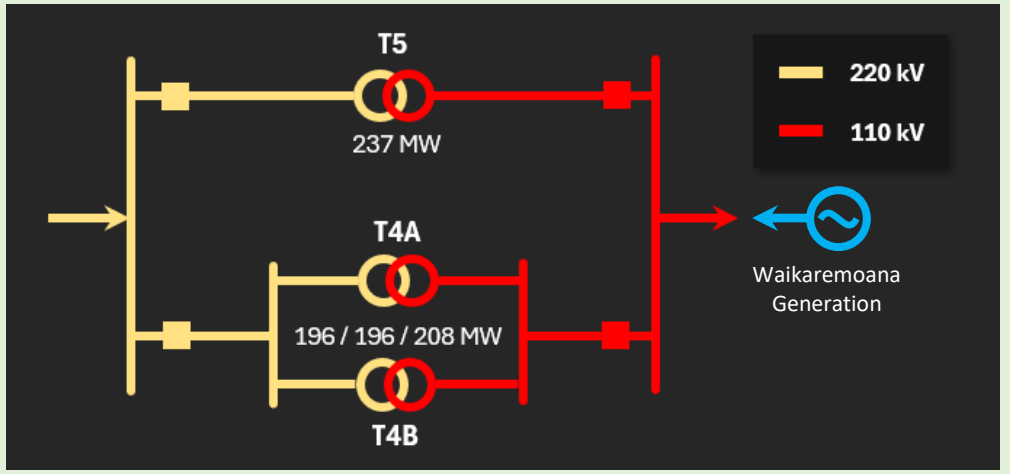
Existing

- A permanent manual constraint manages load through both T3 and T4, pre-contingently.
- **T3 + T4 ≤ 130 MW**.
- When load approaches this limit, generation at Lake Waikaremoana will be constrained on to alleviate loading on the transformers.
- If T3 or T4 trips, the SPS will initiate load shedding to protect the remaining transformer.



Future

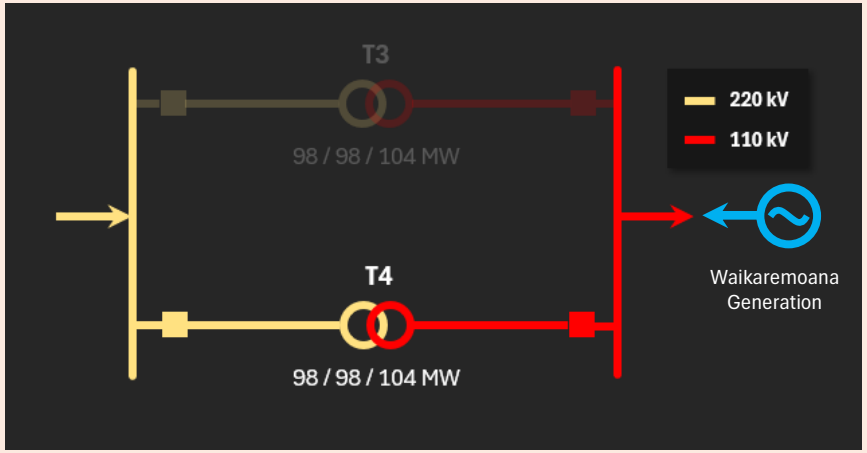
- The permanent manual constraint will be replaced.
- **T4AB + T5 ≤ 220 MW**
- SPS withdrawn. Load shedding no longer needed with current loads.
- The capacity increase means, with current loads, we also no longer need to constrain on generation.



Planned Outage Scenarios and Manual Outage Constraints

Existing

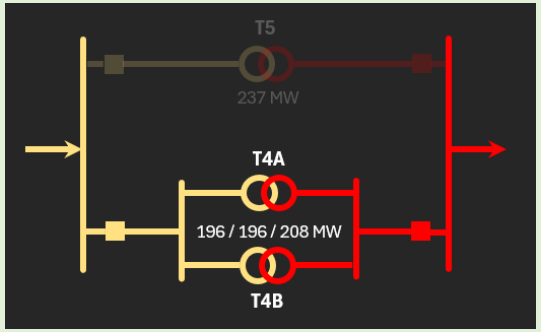
- When we have a **planned outage** on T3 or T4, we apply a manual outage constraint that limits flows through the remaining transformer.
- **T3** or **T4 ≤ 98 / 98 / 104 MW**
- If load approaches this limit, generation from Waikaremoana is constrained on the prevent overloading the remaining transformer.



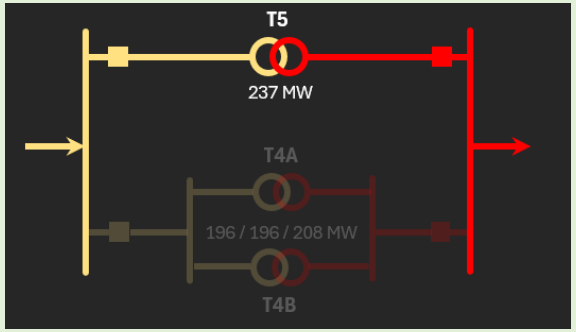
Future

- When we have a **planned outage** on either T4AB or T5, we will still apply manual outage constraints to limit flows through the remaining transformer, but this limits will be much higher due to the capacity increase.
- New manual outage constraints:

If **T5** has a planned outage,
T4AB ≤ 196 / 196 / 208 MW



If **T4AB** has a planned outage,
T5 ≤ 237 MW



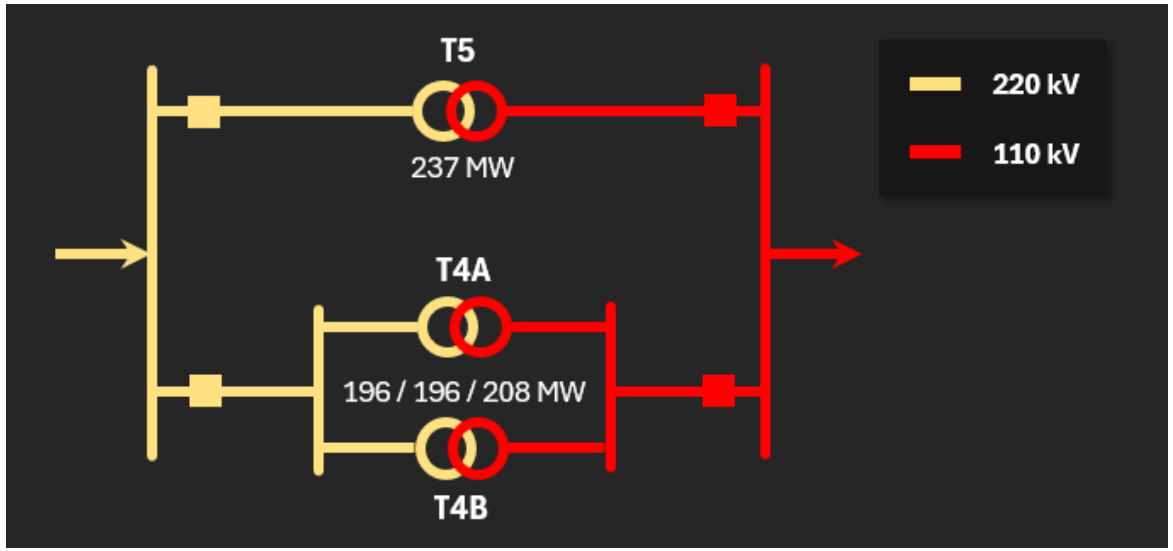
The project's outages and corresponding capacities

Stage Description		Configuration			Total RDF Capacity	Start	Finish	Duration
1	RDF_T3 removed, leaving RDF_T4 by itself. TOPS withdrawn indefinitely. Hawkes Bay & Tairāwhiti on N-security.	RDF_T3	RDF_T4	RDF_T5	104 MW	13/07/2025	27/07/2025	14 days
2	RDF_T5 commissioned. RDF_T5 and RDF_T4 operating in parallel. Hawkes Bay & Tairāwhiti on N-1 security.	RDF_T3	RDF_T4	RDF_T5	120 MW	27/07/2025	26/08/2025	30 days
3	RDF_T4 removed, leaving RDF_T5 by itself. Hawkes Bay & Tairāwhiti on N-security.	RDF_T3	RDF_T4	RDF_T5	237 MW	26/08/2025	9/09/2025	14 days
4	Final configuration. RDF_T5 in parallel with RDF_T4A&B. Hawkes Bay & Tairāwhiti on N-1 security.	RDF_T4AB		RDF_T5	220 MW	9/09/2025	Project complete	

Summary

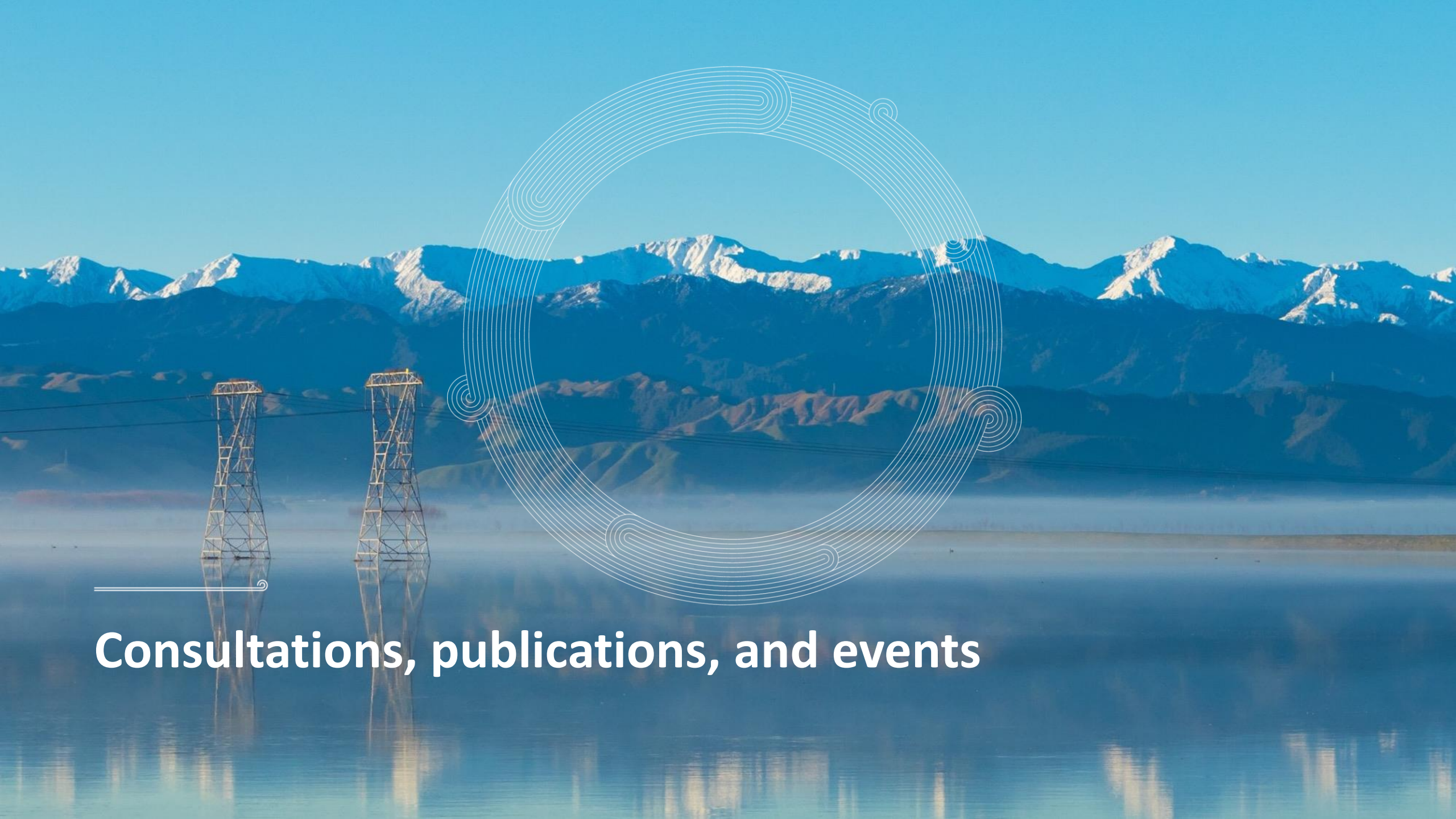
Redclyffe T5

- RDF's total capacity under normal operation increases from **130 MW** to **220 MW**.
- The special protection scheme will be withdrawn.
- The permanent manual constraint and outage constraints will be replaced.
- During both normal operation and transformer outage scenarios, generation from Waikaremoana will no longer be constrained on.



Future considerations

- If loads in the region continue to grow over the next few years, we may need to constrain on Waikaremoana generation and the SPS may need to return



Consultations, publications, and events

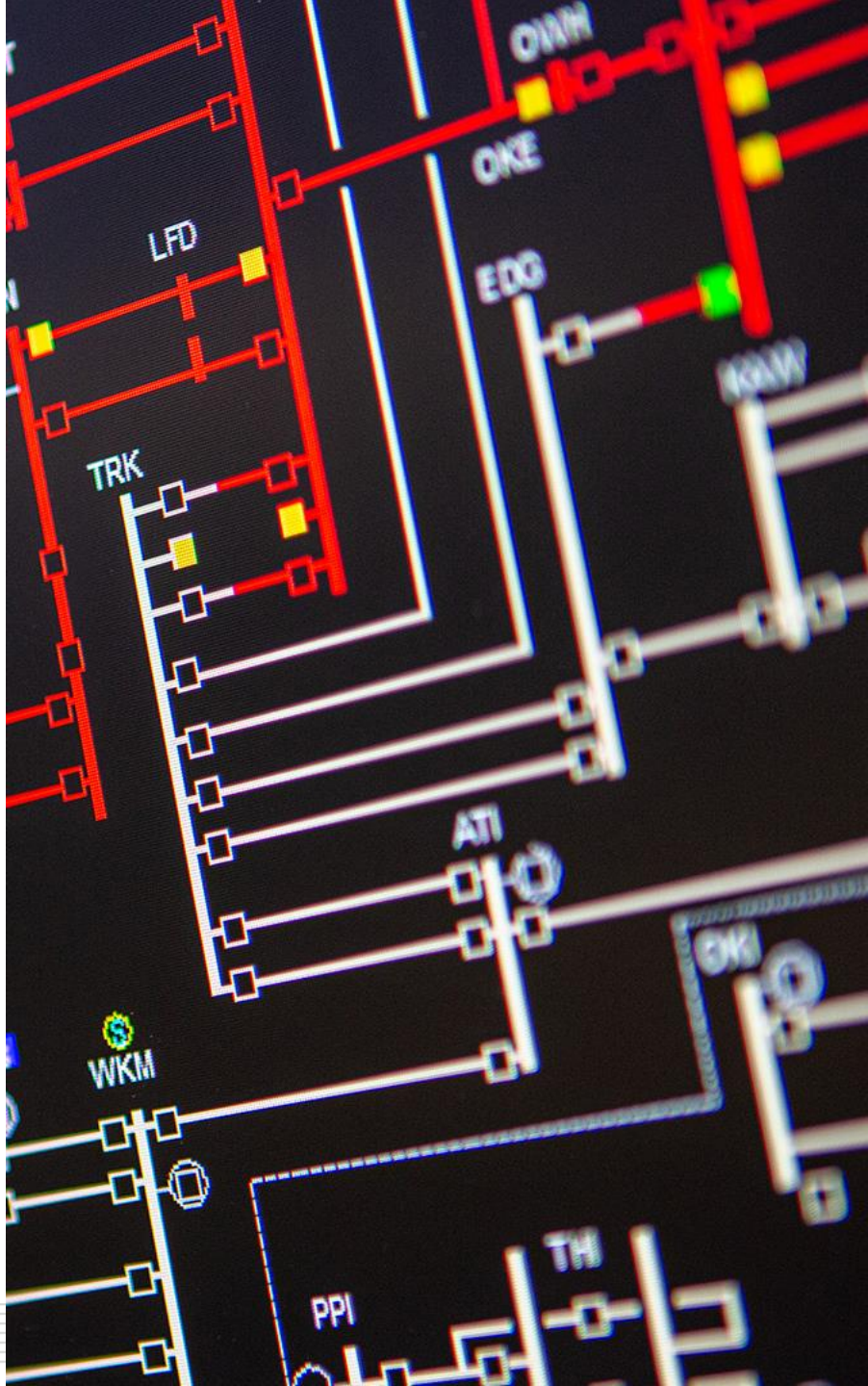
Consultations, publications, and events

We have published our latest **Quarterly Security of Supply Outlook** which is available on our website.

In the next week we expect publish the **July Energy Security Outlook** .

Our **June System Operator Performance Report** is available on the EA's website

The **Hawke’s Bay regional restoration workshop** is on Thursday 7 August in Hastings.



Any questions
Please raise your hand