Security of Supply Outlook – 21 July 2025

Transpower as the System Operator must provide information and short- to medium-term forecasting on all aspects of security of supply, and manage supply emergencies. This document provides the System Operator's assessment of the security of supply outlook into 2026 based on the latest Energy Security Outlook, New Zealand Generation Balance (NZGB), generation commissioning expectations, annual Security of Supply Assessment (SOSA), and observed operational conditions. We provide these updates four times per year.

In summary:

- The market response since our last quarterly outlook and arrival of some inflows helped arrest the rapid decline in hydro storage seen earlier this year and restore it back to average levels. Increased controlled hydro storage together with increased coal and gas storage means increased energy storage for electricity generation relative to the same time last year.
- Continued focus on hydro storage management and ensuring sufficient thermal fuel and generation availability will help support an increased generation response in the event of extended periods of low inflows over the rest of winter and into spring (for instance if expected spring inflows are late) and/or unplanned, extended plant outages.
- National hydro storage is currently at 101% of historic mean levels for the time of year with South Island storage at 95% of historic mean. Storage levels vary across the major controlled hydro catchments, sitting above mean in Lakes Pukaki and Taupo and below mean in Te Anau, Manapouri, Hāwea and Tekapo (as at 21 July 2025).
- This quarterly outlook incorporates our last monthly Energy Security Outlook (ESO) published at the end of June, which shows a reduction in energy risk from the May ESO due to an increase in gas forecasts, and higher starting coal stockpile and gas storage for generation. None of the Simulated Storage Trajectories (SSTs) cross the Watch Electricity Risk Curves (ERC) in 2025, and none approach the Alert ERC or the boundary for contingent storage. This assumes the market continues to manage existing hydro storage levels

through winter and spring inflows arrive as observed historically. If the announced retirement of a Huntly Rankine unit proceeds there will be an increased energy risk in 2026. More recent announcements from Genesis confirm there are ongoing discussions between parties to maintain all three Huntly Rankine units in service. The parties intend the proposal to be in place by 1 January 2026.[1]

- The two major industrial response initiatives activated during this winter which helped arrest hydro storage decline have ended (or are in the process of ending): Methanex's Motonui train has returned after a six-week shut-down during which its gas was on-sold to generators to support increased thermal generation, and the New Zealand Aluminium Smelter (NZAS) 50 MW demand response is expected to be fully restored by 11 August (rather than 25 November).
- As we head deeper into winter, demand is expected to increase with the onset of cooler weather and return of the NZAS load following its demand response.
- Thermal generation has reduced with hydro storage levels increasing back to average levels and declining spot prices. There will be times when the system will be relying on slow start thermal units to meet high peak demand – particularly during cold snaps combined with low wind generation. If there is insufficient thermal commitment, there will be an increased risk in meeting peak demand.
- In the next six months, around ~325 MW of additional generation capacity is expected to be commissioned (~108 MW of solar, 109 MW geothermal, 8 MW hydro), and the 100 MW Glenbrook battery (BESS[2]). Most of this capacity is expected to come online towards the end of 2025. The newly commissioned Ruakākā BESS is currently on outage but once available and offered into the market will provide 100 MW of flexible capacity to the market.
- We continue to work to improve the clarity of our security of supply information and processes. In the last quarter we have published and presented our updated Energy Security Outlook 101, updated information on our website clarifying our response to low residual situations, worked with the Authority to provide a refresher workshop to industry on difference bids, and progressed our Security of Supply Forecasting and Information Policy (SOSFIP) review.
- Our recently published Security of Supply Assessment (SOSA) provides insights into the winter energy and capacity challenges over the next decade. This assessment highlights an increased risk of falling below the winter energy standards largely as a result of the forecast decline in gas availability. In addition, ensuring we meet the winter capacity risks is dependent on the investment of sufficient firm, flexible resources (such as BESS, peaking generation and demand response). While electricity generation investment is accelerating, until sufficient new plant is delivered, the sector must continue to work together to make the most of existing electricity generation

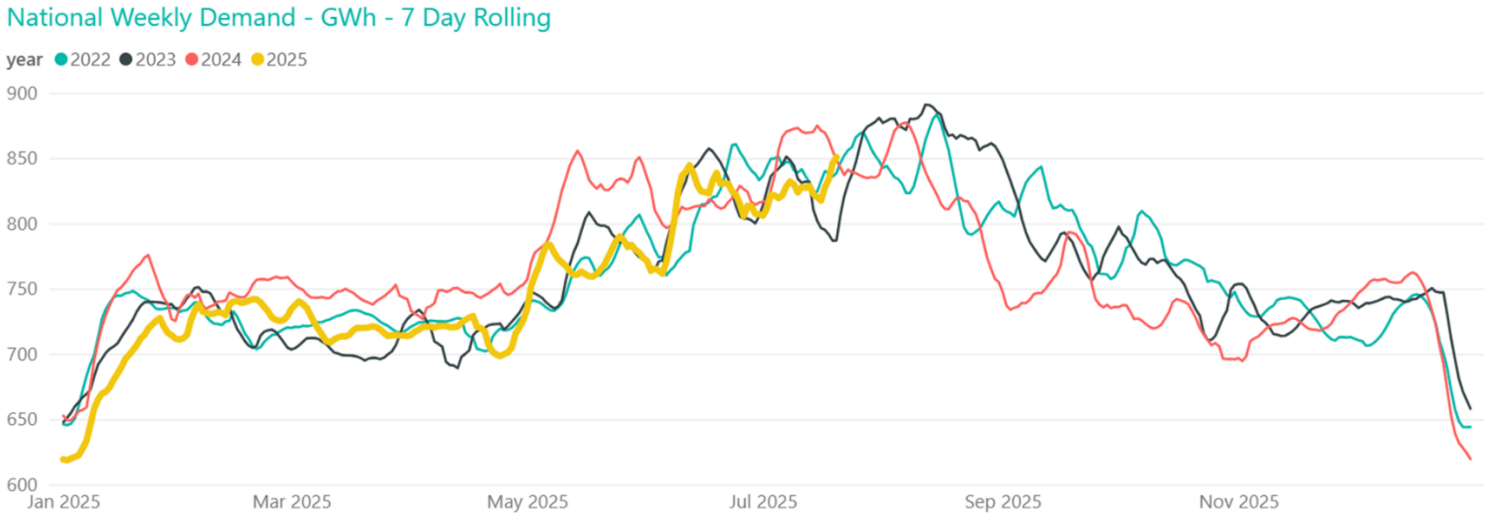
[1] See Term sheet signed for Huntly to support national energy security | Genesis NZ
[2] Battery Energy Storage System

assets. This requires careful maintenance planning and availability of generation units and ensuring sufficient hydro storage and thermal fuel is available to run them across winter.

Demand outlook

Demand during 2025 to date has been lower than in recent years. This is largely due to reduced industrial load with the permanent closure of the Winstone Pulp International mills and Oji's paper recycling plant, and New Zealand Aluminium Smelter (NZAS) demand response arrangements with Meridian Energy. Warmer than normal temperatures during May also contributed to lower demand. Demand in mid-June picked up as colder temperatures swept across the country.

Looking forward to the coming cooler winter months we expect an increase in demand as we typically experience our highest peak demands during July/August winter cold snaps. The restoration of the NZAS load at Tiwai following an end to its latest demand response call with Meridian will add back a further ~25MW of load.[3] However, this will be partly offset with Oji permanently shutting its PM6 paper machine at the Kinleith Mill (~12 MW and ~100 GWh per year) from 30 June 2025.[4]



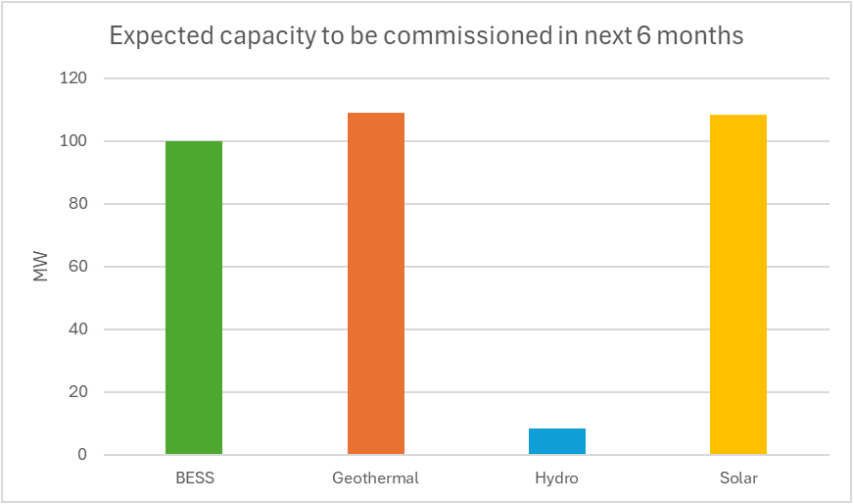
[3] As at the time of this report, Tiwai was half-way through the restoration of its 50 MW demand response.
[4] See here

Supply outlook

Hydro storage levels have returned back to average levels (after being below average for most of 2025). As a result, hydro generation has increased and wholesale spot prices have softened, resulting in lower thermal generation commitment. Contact's TCC generator (330 MW) stopped generating on 26 June (having started on 11 March). TCC is expected to be available for the 2025 calendar year, with its operation constrained to limited operational hours, a five-day notice period to start up, and limited gas for extended operation.[5] The SFD21 peaker (100 MW) has been on an extended outage since 29 April and is expected to be back on 10 August, reducing flexible, firm generation capacity available in the market. The newly commissioned 100 MW Ruakākā BESS is also currently on outage but once available and offered into the market will provide additional flexible capacity to the market.

A key supply risk for 2026 is the ongoing availability of three Huntly Rankine units with Genesis indicating it expects to retire one of them at the start of 2026. Our Electricity Risk Curves and Simulated Storage Trajectories highlights the increased energy risk this presents in 2026. More recent announcements from Genesis confirm there are ongoing discussions between parties to maintain all three Huntly Rankine units in service. The parties intend the proposal to be certain by early November and in place by 1 January 2026.[6]

In the next six months, around ~325 MW of additional generation capacity is expected to be commissioned (~108 MW of solar, 109 MW geothermal, 8 MW hydro), and the 100 MW Glenbrook BESS. None of this capacity is expected to be fully commissioned over the coming winter months (July and August) with the earliest solar farm expected to start commissioning towards the end of August and most of the capacity expected online towards the end of 2025. While we state capacity contributions, these technologies have quite different contributions to the peak and energy requirements of the system. Over the winter months the average[7] contribution from solar is ~16% of its installed capacity (compared, for example, to geothermal which typically operates at ~90% capacity factor). During peak demand periods on cold, dark winter



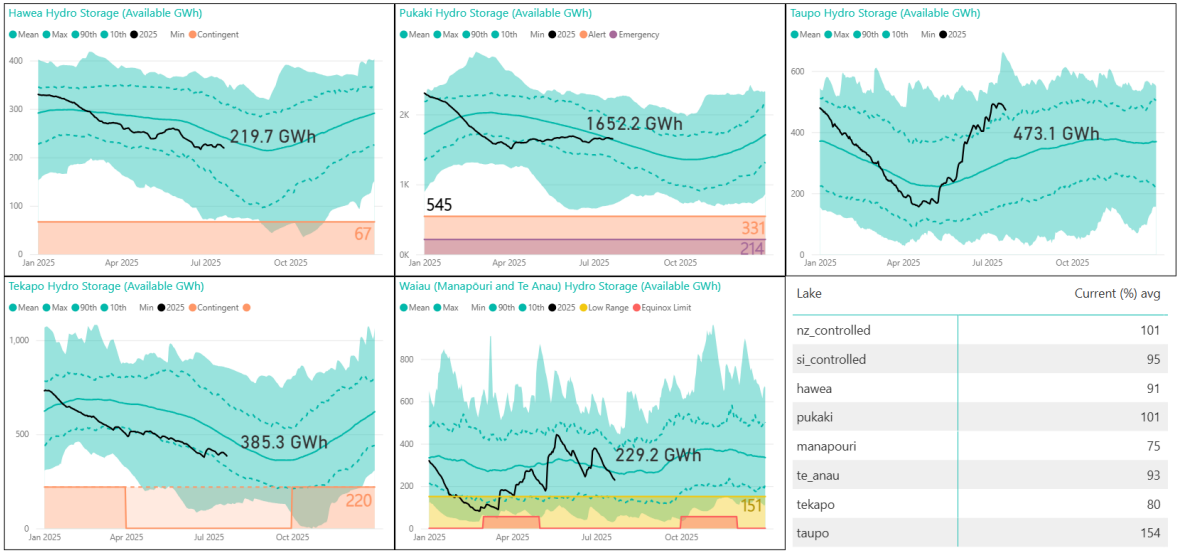
[5] See Contact's 8 November 2024 announcement here.
[6] See Term sheet signed for Huntly to support national energy security | Genesis NZ
[7] Average contribution is an indication of its energy contribution.

evenings, solar has no contribution whereas geothermal, hydro and BESS are firm (non-intermittent) generation sources and could generate up to their maximum. While the new solar generators are an important component of the new supply mix, they provide limited winter energy support and potentially very little during winter peak loads. The Glenbrook BESS in addition to the newly installed Ruakākā BESS will help provide additional fast, flexible generation to help with managing capacity risks.

National hydro storage

A strong market response with increased thermal generation, demand response and some inflows during May and June helped arrest the rapid hydro storage decline seen earlier this year. National controlled storage levels have now been restored back to average levels for this time of year sitting at 101% of historic mean levels as at 21 July. South Island controlled storage storage is still below mean at 95% of average.

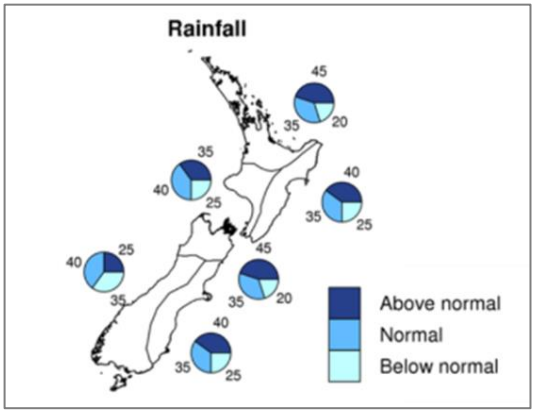
While aggregate storage is back up to near average levels, individual catchments are varied. Pukaki is above mean and Taupo well above mean, with the Waiau, Hawea and Tekapo (and the South Island in aggregate) below mean.



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

We continue to monitor the hydro situation, in aggregate and per controlled storage lake, as individual lakes reaching minimum can reduce their ability to increase output in response to peak demand conditions. We are mindful of factors that could impact controlled hydro storage levels, including:

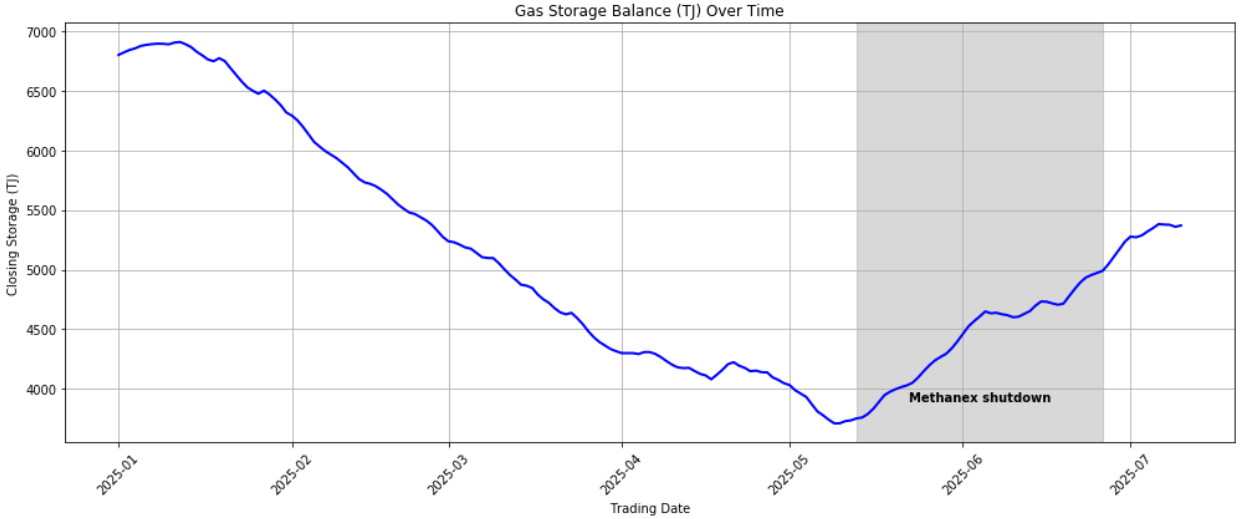
- NIWA's forecast (as at 10 July) is for some rainfall over the next 35 days in regions of the South Island with major hydro catchments. The forecast for the next three months (July-September) is for average to below average rainfall in the west coast of the South Island and average to above average in the North Island
- Meridian expects below average contribution (for this time of year) from Waitaki snow storage ahead of spring 2025[8]
- limited potential options for additional Tiwai demand response for 2025 under currently contracted arrangements with Meridian.



Thermal fuels

The latest publicly[9] reported Huntly coal stockpile is 642 kT (as at 22 June), which is sufficient to produce ~1,290 GWh of electricity from the Rankine generators. This is enough coal to fuel a Rankine generator operating at full output for ~225 days (Rankine days). Based on our current assessment, the firm orders for coal are ~190 kT below what we understand is the physical import capability over the period July-October (equivalent to ~380 GWh which is the energy from one 240 MW Rankine at full capacity for ~67 days).

Ahuroa gas storage is currently (at 17 July) 5.4PJ, which is ~77% of full (~110 Rankine days or ~650 GWh of electricity generation). Methanex has restored its operation after shutting down from 14 May to 25 June to on-sell gas to generators. That additional gas enabled increased thermal generation to arrest hydro storage decline and increased gas stored in Ahuroa for future usage.



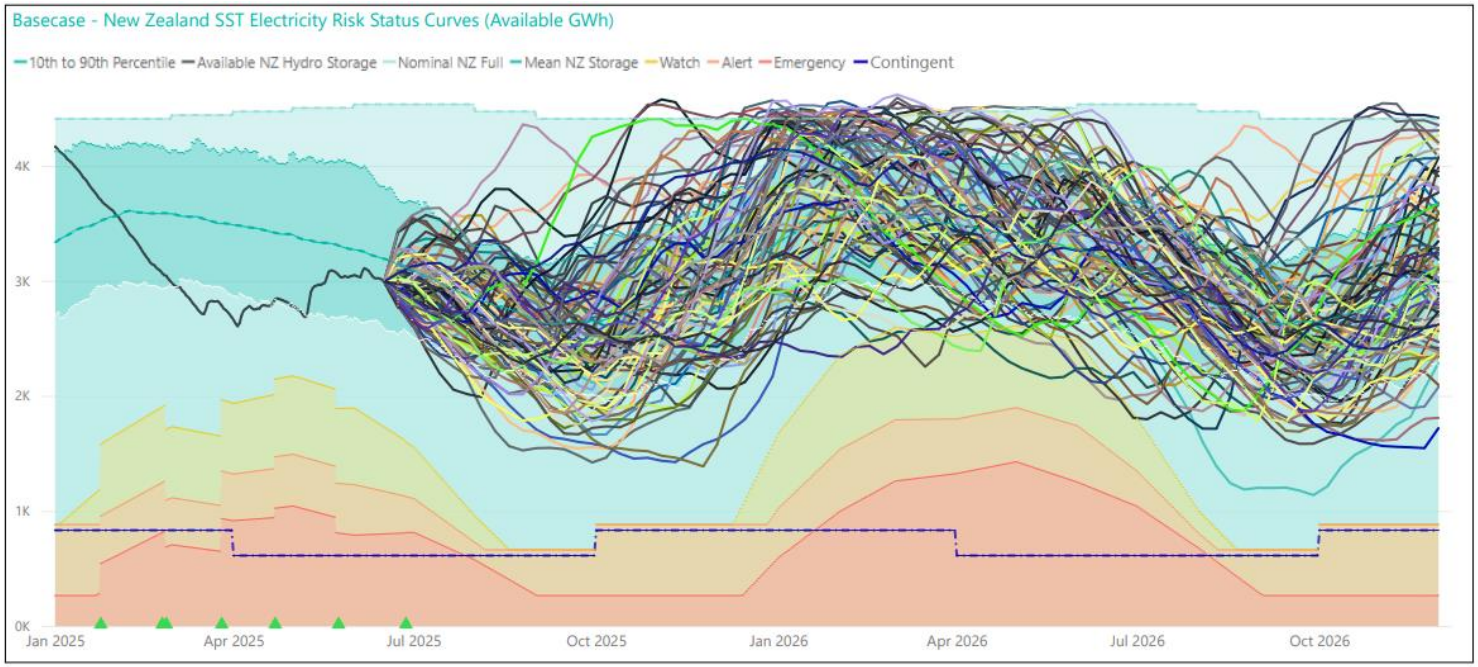
[8] As reported by Meridian on 10-Jul-25 (Snow storage | Meridian Energy)

[9] The Authority has been publishing on its website aggregate information on thermal fuels to increase its transparency in the market. See Thermal fuel information | Electricity Authority

Diesel-fired generation is largely used to provide fast-start, flexible generation during peak load periods (i.e. peaking generation). As such, diesel-fired generators are not expected to run for extended periods of time. There was ~3.95ML of stored diesel available for electricity generation as at 22 June. This is equivalent to ~14 GWh or ~2.5 days of running a Rankine unit at full output.

Energy Security Outlook

Our latest Energy Security Outlook update (combining ERCs and SSTs) published on 27 June[10] shows a slight drop in the 2025 risk curves compared to the May update. This is primarily due to increased gas production forecasts, a higher starting coal stockpile and a higher starting gas storage level.



With the starting hydro storage recovering back up to mean levels for this time of year, none of the simulated storage trajectories (SSTs) cross the risk curves in 2025. This assumes the market will contract to supplement current thermal fuel storage levels (coal and gas) and to maintain increased thermal generation during low hydro inflow scenarios. While the market has responded to reduce hydro storage risk in 2025, continued focus on hydro storage management and ensuring sufficient backup thermal fuel availability will support an increased thermal generation response under extended periods of low inflows over winter and/or extended unplanned asset outages.

[10] The Energy Security Outlook (ERCs and SSTS) are published on our webpage and stakeholders can subscribe to be notified when updates are published: Energy security outlook | Transpower

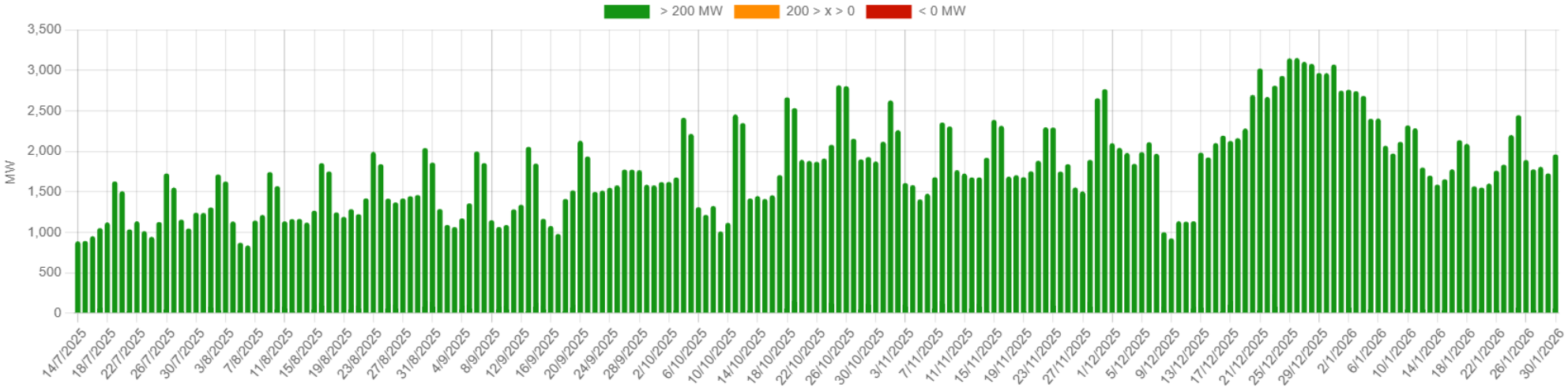
The increase in the risk curves in 2026 is largely due to the announced exit of the Huntly Rankine unit by Genesis which reduces the amount of backup thermal generation to support the system during extended low inflow periods. In 2026, 11 of the 93 SSTs cross the Watch curve. To highlight the impact on the energy risks in 2026, we analysed a scenario assuming all three Huntly Rankine units were available in 2026. If this occurred and there was sufficient coal to enable their operation during extended dry periods, the risk curves in 2026 reduce with only one SST reaching (just) the Watch curve in 2026. This highlights the importance of sufficient thermal backup generation to manage dry year risks in our system. Our recently release SOSA echoes this sentiment showing increased risk in meeting the winter energy standards if thermal generation exits without sufficient new supply-side resources in the market.

Capacity outlook

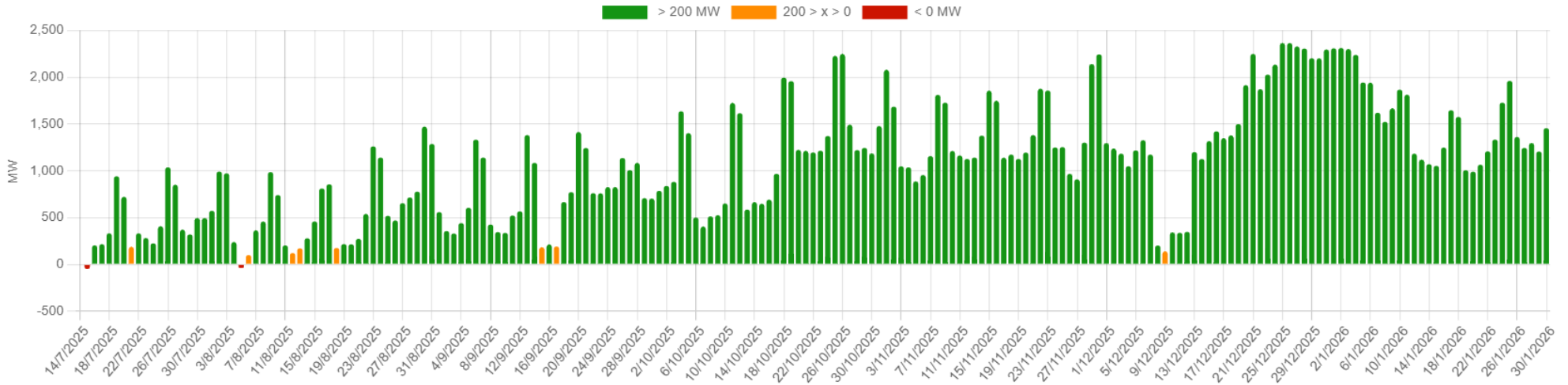
The New Zealand Generation Balance (NZGB)[11] provides a forward assessment of the potential generation margins 200 days ahead based on a P90 forecast peak demand,[12] asset outage information provided by asset owners, and considering different generation availability and demand scenarios. The figures below show NZGB margins for two scenarios as at 14 July. The scenarios are described before each figure.

The NZGB scenario below is where all generation not planned to be on outage is available during peak load periods (based on a P90 load forecast and covering the "N-1" risk).[13] Based on current information the forecast residual generation margins over the 200 days to mid-October 2025 is likely to be sufficient to cover peak national demand assuming the market co-ordinates the available generation and commits sufficient generation capacity.

[11] See here Customer Portal - NZGB (transpower.co.nz)
[12] A P90 load forecast represents the 90th percentile load that we could expect to see on any given day.
[13] Running the system to cover "N-1" risk is normal market operation. The market is cleared to supply the demand and the reserve requirements (largest contingent event risk on the system).



Our NZGB tool allows participants to assess the impact on the power system's capacity to meet peak demand should downside risks be realised (for example unplanned outages, commitment of fewer slower-start thermal generators, different levels of forecast demand). As hydro storage recovers back to average levels, the wholesale spot price has reduced resulting in less slow-start thermal units being committed to the market. If we had a sudden onset of colder weather, low wind generation with insufficient time to bring on these slower-start thermal units then we could see increased capacity risks over the coming months to mid-September, as outlined in the scenario below.



While energy has been a key challenge this year, peak capacity risks are ever-present and will become more acute if fewer thermal units are committed. Capacity risks will persist until there is sufficient investment in flexible resources such as BESS, demand response and peaking generation. The Ruakākā BESS, once offered into the market, will help meet this system need - as would investment in other BESS in the supply pipeline. Genesis is also exploring potential for additional fast-start generation capacity at its Huntly power station, which if progressed will increase the flexibility of the generation fleet.[14]

Energy risks can also result in capacity risks, as was the case in 2024. Our August 2024 decision to bring forward access to contingent storage was to mitigate the risk that the system may not have been able to meet peak demand during a spring cold snap should both the Waitaki and Clutha generation schemes be unable to flex up. This could have occurred if the storage lakes had reached the boundary of contingent storage without actual aggregate hydro storage having crossed the Alert ERC. In this situation river flows are required to be held to inflows and the ability of the generators to flex up to meet intra-day peak demand is compromised. We will continue to monitor the trajectory of storage for each lake with contingent storage as outlined in our ESO 101.

[14] See Genesis exploring new generation plant for Huntly site | Genesis NZ

A continued focus on energy and capacity can mitigate Winter 2025 risks

A combination of market response through increased thermal generation, demand response combined with increased inflows over the last couple months has helped restore hydro storage back up to average levels for this time year. The coal stockpile and gas storage have also increased. The net effect is increased energy storage for electricity generation relative to the same time last year. To help manage energy risks over the remainder of winter, continued focus on hydro storage management and ensuring sufficient backup thermal fuel availability will support an increased thermal generation response under extended periods of low inflows over winter and/or extended unplanned asset outages.

As hydro storage increases relative to mean, we start seeing lower wholesale spot prices. This reduces the incentives to run generators with higher operational costs such as slower-start thermals. A result can be increased capacity risks if there's insufficient flexible resources that can come online quickly in response to changing system conditions (such as an increase in demand with a sudden cold snap and/or reduction in generation). To reduce capacity risks, participants will need to ensure there is sufficient generation committed in the market to run over periods where demand is highest and/or other generation capacity is constrained. Introduction of the new Ruakākā BESS will help increase the quantity of flexible resources in the market (once it is being offered). Additional flexible resources (BESS, peaking generation and demand response) need to come online to reduce this risk going forward as we also have more intermittent generation in the power system.

Not only do we need these resources to come online, there also needs to be sufficient incentives and ability for them to clear in the market. The Authority's increase in scarcity prices on 17 April 2025 has helped increase the ability for the market to clear these resources and thus reduced the need for system operator discretion or having to run the system with less reserve cover. Other market enhancements[15] are also needed to ensure the market remains fit-for-purpose going forward to co-ordinate these resources and ensure sufficient investment signals to build.

System Operator planning for 2025

The System Operator has been and is continuing to work on multiple initiatives for better managing winter 2025 risks. These include:

- Engagement with stakeholders on potential amendments to ensure the 200MW low residual threshold and process for coordinating low residual situations with industry remain fit for purpose.

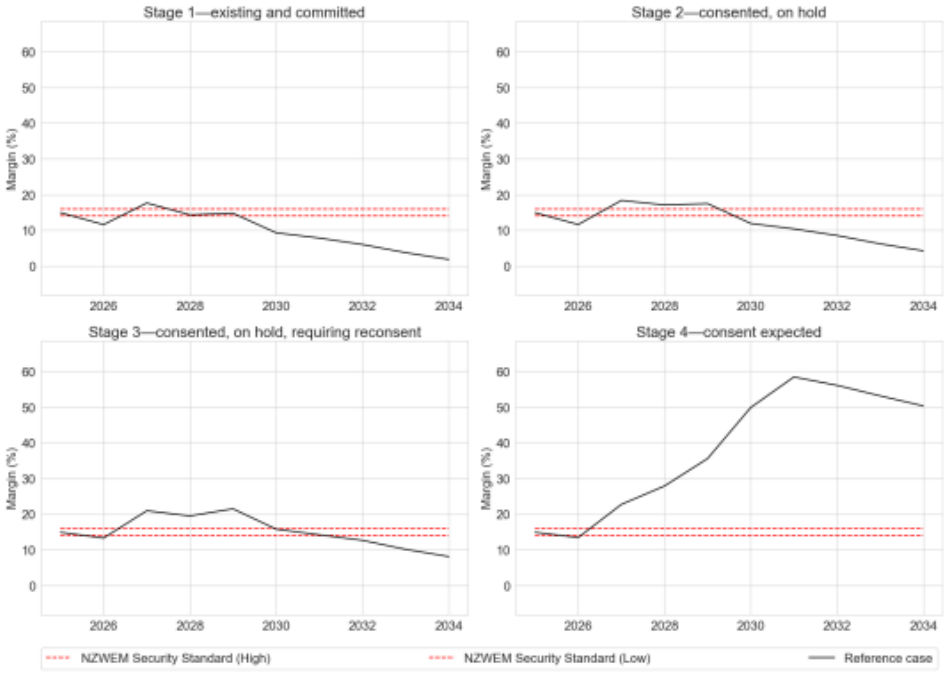
[15] These include ensuring the market can operate with an over-supply of zero-priced offers, co-ordinate BESS operation and that the overall market security settings are still fit for purpose.

  - Our summary of, and response to, the 6 submissions and two cross-submissions we received has been published. **Completed**
  - We have introduced monitoring and reporting on the performance of the 200 MW threshold in catering for the variability between forecast and real-time generation requirements in our System Operator monthly reports. **Completed**
  - Updated information is on our website clarifying the process for notifying and managing energy or reserve shortfalls. **Completed**
- Improvements to the ERCs framework to better support industry coordination of security of supply:
  - We are progressing our work with the Authority and engagement with stakeholders on a SOSFIP review: Invitation to Comment: Security of Supply Forecasting and Information Policy Review Issues Paper 2025 | Transpower. **In progress.**
  - We completed a preliminary Issues paper consultation on potential changes to rules around how we prepare and publish information to assist participants to manage security of supply risks. Our summary of the 15 submissions and four cross-submissions we received, and the decisions we made in response to them, has been published. **Completed**
- Clarifying contingent storage access arrangements: We worked with the Authority to improve industry and stakeholder understanding of the SOSFIP CSRB buffer discretion, and our criteria for deciding whether to bring forward access to contingent storage as we did in 2024. The Security of Supply outlook published in early February, and the SOSFIP review Issues paper summary and decision document, provided information for this purpose. This information has also now been incorporated into our updated ESO 101 document. **Completed**
- Engaging with key hydro generators, particularly those with contingent storage arrangements, to ensure our assumptions about operational constraints due to low lake levels remain correct. **Ongoing**
- Working with the Authority we hosted an industry exercise on 9 April 2025, supported by preparatory webinars on 4 and 18 March to provide participants with knowledge to support their involvement. This year's exercise covered our dry year processes, official conservation campaigns, rolling outage plans, consumer care obligations and communications between the System Operator, market participants, public agencies, consumers and key stakeholders. **Completed**
- Continuing our work to implement the new System Operator Rolling Outage Policy (**SOROP**) expected to be implemented before Winter 2026. **In progress**
- Implementing the Authority's decision to amend scarcity prices settings in the market system and our processes. The new settings took effect on 17 April 2025. **Completed**
- Supporting the Authority to implement the hybrid intermittent generation forecasting arrangement, to take effect on 31 July 2025. **In progress**
- Together with the Authority we ran a difference bids refresher workshop for asset owners on the use of difference bids to increase visibility of controllable load during low residual situations. **Completed**

Looking beyond 2025

A key risk looking beyond winter 2025 and into 2026 is the availability of three Rankine generating units in the market. Our June ESO highlights the increased energy risk if a Rankine unit exists in Winter 2026.

Looking even further ahead (over the next decade), our recent Security of Supply Assessment (SOSA) highlights the need for sufficient thermal generation and fuel to help maintain the energy margins above the security standards until sufficient new generation comes online. The forecast decline in gas availability has meant an increased risk of the national winter energy margin falling below the security standard by 2026 with new supply-side projects needed to restore the margins above the winter energy security standard over the next decade. While consented projects are sufficient to manage this out to 2031,[16] currently unconsented projects need to come to market to maintain the margins beyond this time. A key risk to the winter energy margins is the availability of thermal backup generation (including availability of fuel). Our analysis shows that even faster build of new generation is needed to restore margins back up above the standards if there is less thermal back-up generation (e.g. Rankine retirement and/or faster decline in gas availability) or increased demand than forecast.



The SOSA analysis shows the winter capacity margin drops below the standard in 2029 (later than the energy margin). Investment in firm, flexible resources (such as BESS, peaking generation and demand response) and to a lesser extent wind and solar will help increase the winter capacity margins.

[16] This is the Stage 3 supply-side scenario which includes existing, consented and committed projects as well as consented but on hold and projects requiring reconsent or consent revision. Stage 4 is Stage 3 but also including unconsented projects.

The supply pipeline is being developed and continues to expand. These are all positives. Delay in these new resources entering the market will put strain on existing resources, impacting the ability to manage energy and capacity challenges and the affordability of electricity supply for consumers. To reduce this risk, asset owners (including generators and grid and distribution network owners) should continue to accelerate new supply connecting to the grid, prioritising firm energy and firm, flexible capacity resources.