Meeting Date: 27 May 2021

UPDATE ON SECURITY OF SUPPLY SITUATION

SECURITY AND RELIABILITY COUNCIL

This paper summarises for the SRC, the industry mechanisms for dry-year risk and how those mechanisms have responded to security of supply issues relating to hydro inflows and thermal energy resource availability.

Note: This paper has been prepared for the purposes of the Security and Reliability Council. Content should not be interpreted as representing the views or policy of the Electricity Authority.

1 Purpose

1.1.1 The Security and Reliability Council's (SRC) functions under the Electricity Industry Act 2010 include providing "independent advice on the performance of the electricity system and the system operator, and reliability of supply issues". (Electricity Industry Act, s20)

1.1.2 To assist the SRC in its work, Authority staff have asked the Secretariat to prepare a summary paper setting out the current dry-year risk, the mechanisms in place, and the steps being taken by the System Operator and industry participants to ensure ongoing security of supply.

1.1.3 This paper is not intended to summarise the current regulatory arrangements or assess their effectiveness. See fit for purpose reviews of regulation and monitoring prepared for the SRC for discussion at this meeting.

1.1.4 The paper is not intended to discuss or comment on the level of wholesale prices.

2 Background - Hydro conditions, gas supply and outlook for winter 2021

2.1.1 NIWA has indicated 2020/2021 is a La Niña year, characterised by moist, rainy conditions to the north–east of the North Island, and reduced rainfall to the south and south–west of the South Island. Reduced inflows to the main hydro storage lakes can result in a dry-year scenario.

2.1.2 In a dry year scenario, thermal electricity production is used to conserve hydro water to ensure there is enough fuel (water and gas) to supply electricity demand through winter, until expected rainfall and snow melt flows into the hydro catchments in spring and summer.

2.1.3 The availability of natural gas for thermal generation is also constrained this year. Pohokura's gas production has reduced from over 200 terajoule (TJ)/day in early 2020, down to approximately 120TJ/day at the start of 2021. The spot price for gas is higher than historical averages. All available gas is contracted, and users including some generators have had to accept a reduction in their contracted quantities.

2.1.4 Thermal generators are building gas and coal storage volumes to help meet winter demand. This mitigates some risks associated with the greater use of thermal generation over winter in the event that La Niña weather patterns continue and water inflows remain constrained.

2.1.5 Other factors affecting generation and hydro storage, and therefore are feeding into the assumptions underpinning the Electricity Risk Curves (ERCs) are:

a) Carbon prices are up around 50% from a year ago.

b) Wind generation has been lower than normal for this time of year.

c) Other minor changes to gas production and diesel supplies.

2.1.6 The following three graphs show the year started from a lower base (lower lake levels) and in-flow summer decline started earlier in the year:

Figure 1 - Historical electricity risk curves

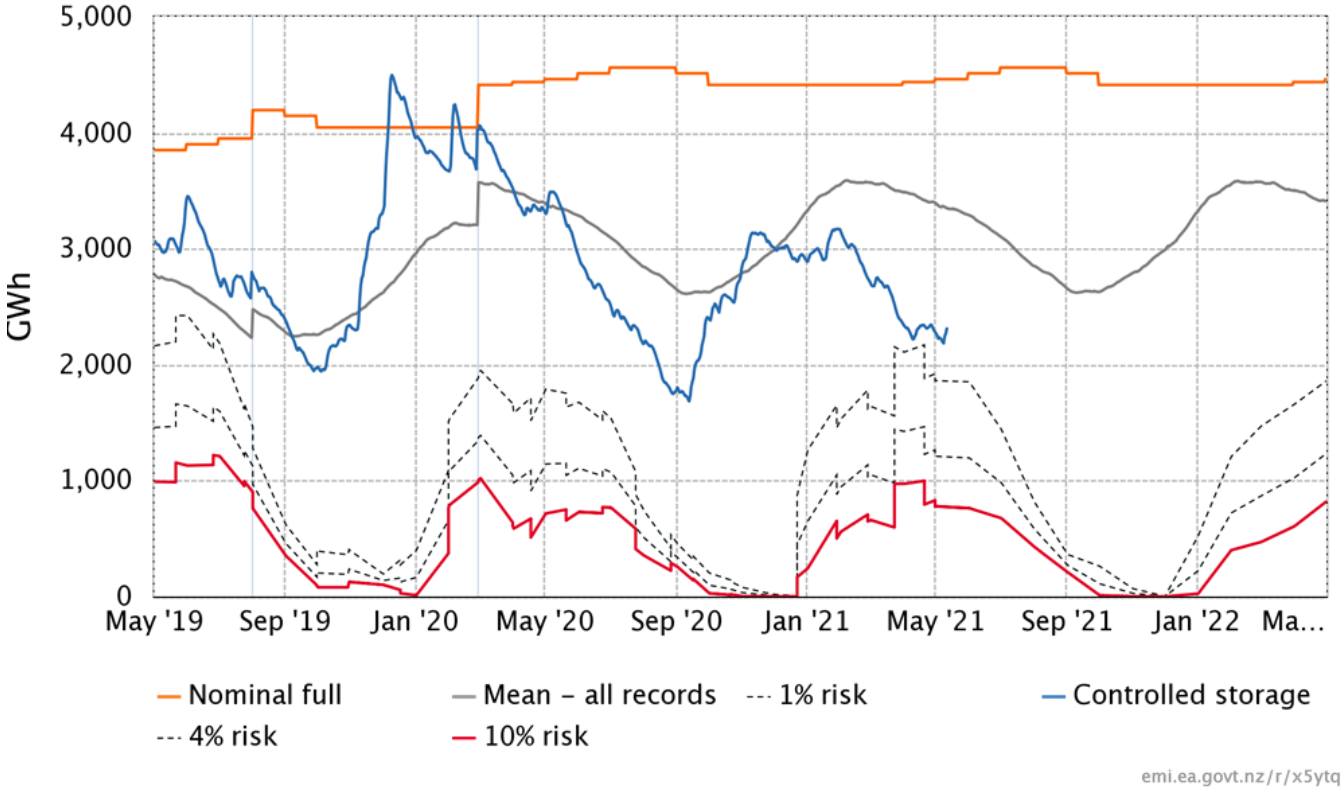


Figure 2 - Historical storage and status curves

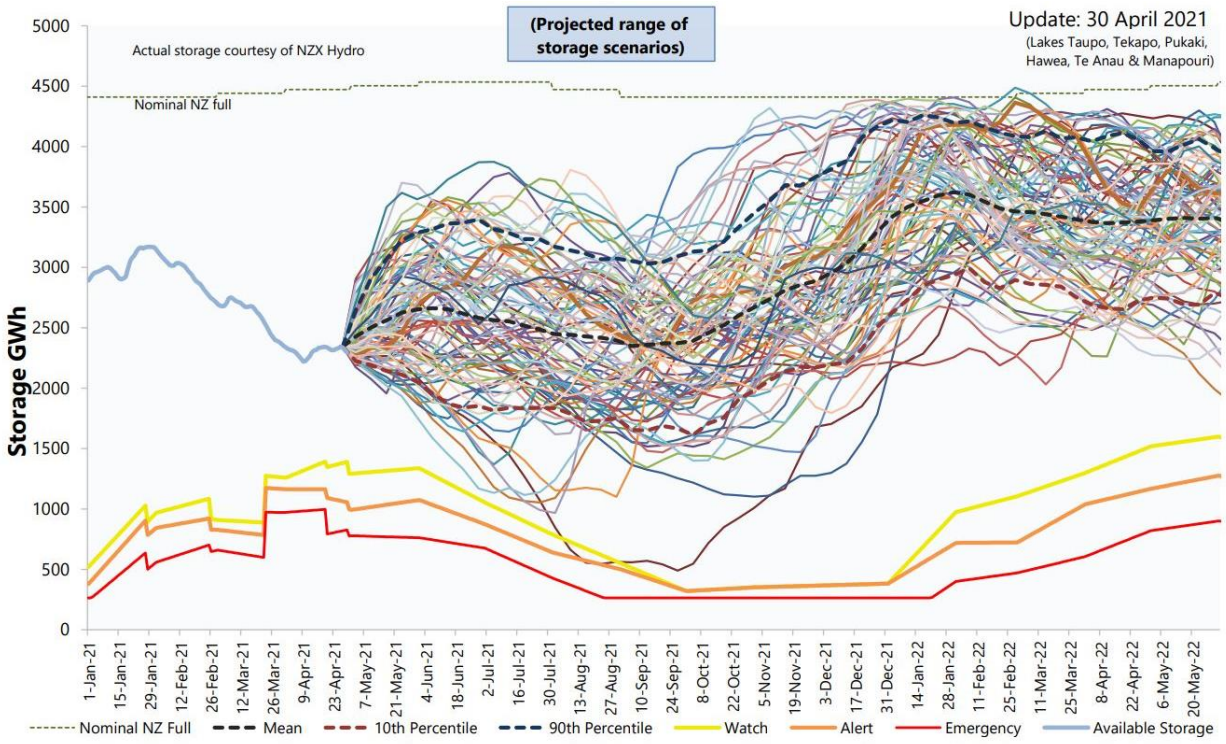
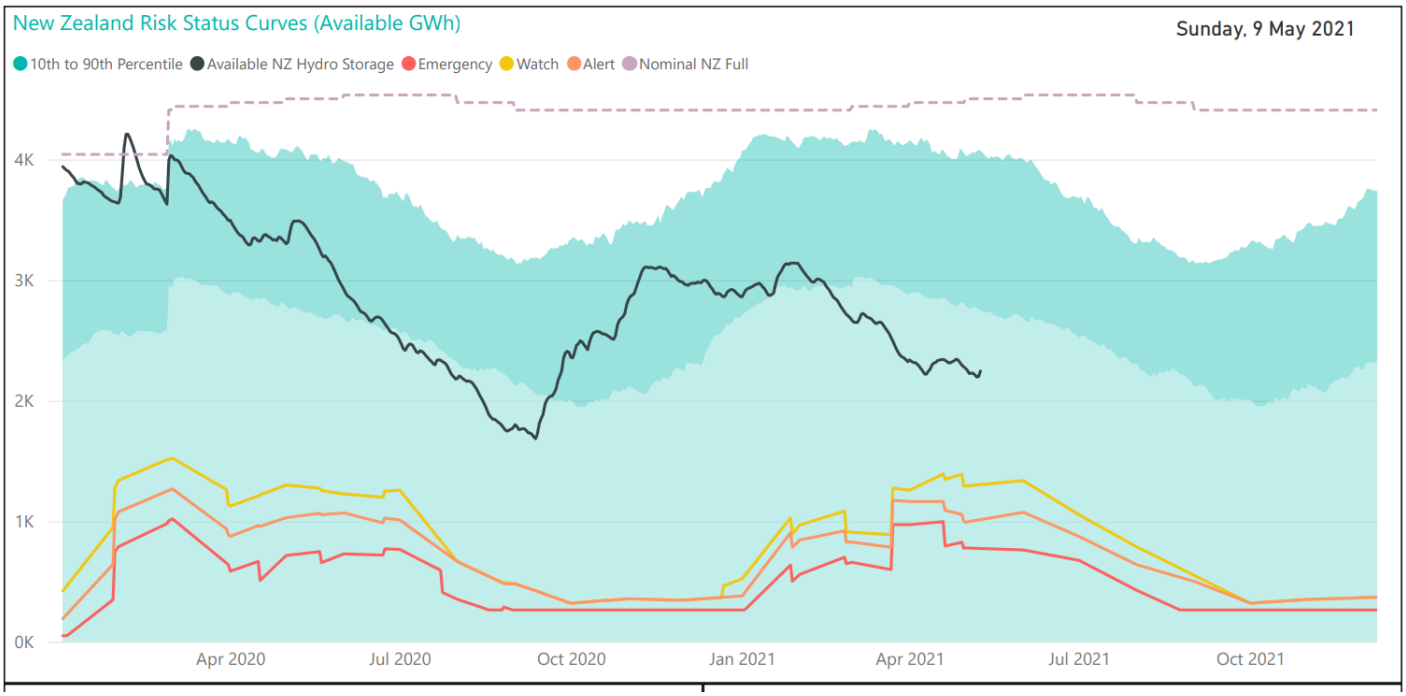


Figure 3 New Zealand Risk Status Curves



2.1.7 These curves show the time away from the need for an Official Conservation Campaign (OCC). Despite being close to the 1% curve, we are some way off from an OCC.[1] In mid-April, storage decline has slowed considerably, and even increased as a result of rain in early May. Additionally, revisions to the ERCs as more information becomes available has lowered the risk curves. The 30 April simulated storage trajectory chart shows only one historical inflow sequence crossing the watch curve, and just touching the alert curve in mid-August.

2.1.8 For detailed discussion of the ERCs please see the fit for purpose review of security of supply forecasting and OCCs later in this meeting.

3 Security of supply is being managed

3.1.1 The following actions are either being taken or are available, if necessary, to ensure any impact of the current dry-year scenario is understood and addressed:

a) Cross-regulator governance group led by MBIE meet regularly to coordinate response

b) Authority responding to recent commentary through a comprehensive response to inaccurate publicity [2]

c) Initiating increased monitoring and reporting of information to industry, by the Authority and by the system operator

[1] For more detail about OCCs, what they mean, and when they start and end, please see section 2.4 and Appendix A of the paper under Tab10a in the document pack.

[2] In this edition of Market Brief the Authority corrected public misperceptions about security of supply: https://www.ea.govt.nz/operations/wholesale/security-of-supply/spot-prices-and-the-wholesale-market-review/

d) Engaging regularly with industry though face-to-face dialogue

e) System operator monitoring grid outages that could impact water conservation efforts in case deferral is required

f) System operator planning for implementing changes to grid assets and operation to facilitate greater transmission capacity

3.1.2 As part of its monitoring function, the Authority:

a) is refocusing its review of the wholesale market to include competition in the spot market and investigation of the structure, conduct and performance of the spot market since 2018. This review will be released in the third quarter of 2021.

b) Has work underway (arising from the Electricity Pricing Review) to help ensure both generation and retailing are competitive, and there is greater transparency of profitability[3]

c) is working with MBIE to keep Ministers appraised of the immediate impacts, with the view the market is operating as it should and helping understand what policy responses could mitigate this in future.

d) is seeking input from the System Operator, generators and large industrials to ensure full understanding of the assumptions that underpin the risk assessment tools (ERCs and others)

e) is engaging with the electricity and gas sectors to understand risk levels regarding fuel availability, particularly gas supply constraints.

3.1.3 The Authority is also working on gaining assurance:

a) about what the sector is doing to ensure thermal capacity is available;

b) whether wholesale electricity spot prices reflect the actual fuel supply position of generators;

c) about the full impacts on consumers should the current high prices continue for a protracted time.

3.1.4 There are further various institutional features of the market which seek to mitigate dry-year risk. These include:

3.1.5 Stress test regime

a) The stress test regime encourages wholesale market participants to be accountable for their risk management decisions encouraging investment in generation and demand response capacity.

b) The regime gives participants information on the consequences of their exposure to spot market prices during illustrative energy and capacity shortage scenarios. Disclosing participants (directly connected consumers and parties buying electricity from the clearing manager) calculate their exposure each quarter and disclose this information to their own Boards and an independent party appointed by the Authority (the stress test registrar). The Authority receives summary information from the registrar – quarterly stress test reports –

[3] Ibid

which must not identify any individual participant. The Authority publishes the quarterly stress test aggregate reports on its website.

3.1.6 Scarcity pricing

a) Scarcity pricing refers to arrangements to modify prices in the wholesale electricity market (spot market) when the system operator reduces demand through administrative action, for example emergency load shedding due to insufficient energy supply.

b) Scarcity pricing ensures spot prices remain high enough to give investors' confidence that emergency load shedding will not undermine the business case for investing in last resort generation or demand response capability. This should ensure forced power cuts occur only when they are economically justified.

4 The spot market response

4.1.1 As noted in *Market Brief* 27 April 2021[4]:

> *In situations like now, where we are experiencing low supply, the spot market helps generators to schedule generation that reflects scarcity. So, with low hydro inflows and reduced gas availability, generation is priced more highly to reflect this scarcity, and the spot price increases accordingly. This in turn encourages generators who can procure fuel, to do so. It also ensures that all generation that can generate does, reducing the chance of running out of fuel*.
>
> *Given the sector is grappling with constrained fuel, the resulting spot prices are high, but not unexpected. Current spot prices reflect generators conserving fuel for use in the winter when demand is higher. Any other response in a scarcity situation would suggest the market is not working.*

5 Questions for the SRC to consider

5.1.1 The SRC may wish to consider the following questions.

Q1. Does the SRC believe the existing mechanisms available to the Authority are fit for purpose?

Q2. Does the SRC believe the information being made available to the Authority and the system operator by generators is sufficient?

Q3. Does the SRC consider the information being made available to the Authority and system operator by both participants and non-electricity participants is sufficient?

Q4. Does the SRC consider the stress test regime helps the industry assess their business risks, as a component of their wider risk management?

Q5. Does the regime fulfil its purpose of having a sufficiently robust framework not unduly susceptible to the intervention of individual participants?

Q6. Does the SRC think the current situation is being sufficiently managed?

[4] Ibid

Q7. What further information, if any, does the SRC wish to have provided to it by the secretariat?