2021 Dry Year event review

Consultation paper

Submissions close: 5:00pm, Tuesday 25 January 2022

Published: 14 December 2021

Market Policy

Contents

1 What you need to know to make a submission

What this consultation paper is about

1.1 The 2021 Dry Year event is about how the industry managed the fuel supplies in the lead up to the winter of 2021 (January to June 2021). The purpose of this paper is to consult with interested parties on the independent review of the 2021 Dry Year event.

1.2 The Authority wants to learn from the management of the dry year event. The review canvassed the perceptions of the generators and central government and features some important observations. We now want to give retailers, consumers, and other stakeholders the opportunity to respond and give us their thoughts.

1.3 This consultation is not about amending the Code or any of the documents incorporated by reference, such as the system operator Forecasting and Information Policy (SOSFIP) and Emergency Management Policy (EMP), or the Spot Price Risk Disclosure regime (stress tests). There are separate parallel workstreams reviewing these detailed policy settings, and we will separately consult on any proposed changes.

1.4 The scope of the dry year event review included:

(a) The Authority's actual and perceived performance during the event

(b) The system operator's actual and perceived performance during the event

(c) The dry year risk regime and incentives

(d) The preparedness of the industry (including the Authority)

1.5 The review scope did not include overarching suitability of market structure or trends within wholesale prices, except in the context of the acute impact of wholesale pricing on securing the outcomes sought by the security of supply regime. These items are covered by a separate review – the Wholesale Market Competition Review.[1]

The difference between 'energy' and 'capacity' - 9 August 2021

1.6 'Energy' is the supply of electricity over a sustained period of time. The energy supply is a factor of fuel availability and management, especially hydro water storage, and the total that is available to generate.

1.7 'Capacity' is the availability of enough electricity to supply the demand at each given point in time. It is a factor of the actual generators that are offered and capable of generating at a point in time, and the capability of the transmission system to move electricity from the source s of generation to consumers.

1.8 The loss of supply event on the evening of 9 August 2021 was a capacity event. There are several separate investigations[2] being conducted into the 9 August 2021 event and as such, the 9 August event is out of scope for this consultation.

[1] See: Wholesale market competition review — Electricity Authority (ea.govt.nz)

[2] The Authority's investigation is available Review of 9 August 2021 event under the Electricity Industry Act 2010

How to make a submission

1.9 Our preference is to receive submissions in electronic format (Microsoft Word) in the format shown in Appendix B. Submissions in electronic form should be emailed to Consult-2021DryYearReview@ea.govt.nz with "Consultation Paper— 2021 Dry Year Review" in the subject line.

1.10 If you cannot send your submission electronically, post one hard copy to either of the addresses below, or fax it to 04 460 8879.

Postal address	Physical address
Submissions Electricity Authority PO Box 10041 Wellington 6143	Submissions Electricity Authority Level 7, Harbour Tower 2 Hunter Street Wellington

1.11 Please note the Authority wants to publish all submissions it receives. If you consider that we should not publish any part of your submission, please

(a) Indicate which part should not be published

(b) Explain why you consider we should not publish that part

(c) Provide a version of your submission that we can publish (if we agree not to publish your full submission).

1.12 If you indicate there is part of your submission that should not be published, we will discuss with you before deciding whether to not publish that part of your submission.

1.13 However, please note that all submissions we receive, including any parts that we do not publish, can be requested under the Official Information Act 1982. This means we would be required to release material that we did not publish unless good reason existed under the Official Information Act to withhold it. We would normally consult with you before releasing any material that you said should not be published.

When to make a submission

1.14 Please deliver your submissions by **5pm** on Tuesday **25 January 2022**.

1.15 We will acknowledge receipt of all submissions electronically. Please contact the Authority info@ea.govt.nz or 04 460 8860 if you don't receive electronic acknowledgement of your submission within two business days.

The Authority would like your feedback

The security of supply regime

2.1 The security of supply regime is an implicit part of the electricity market design. Coupled with some explicit policy settings, the regime's purpose is:

(a) to ensure the electricity supply to consumers is resilient in the event of a dry year. That is, the role of higher prices is recognised as an appropriate means of rationing to ensure we get through the dry year, including promoting efficient operation in the event of dry-year scarcity and efficient investment in generation and demand response to manage dry years;

(b) to incentivise the efficient management of a medium-term energy scarcity situation (the risk of generation undersupply leading to consumer outages), ideally while minimising the total cost to consumers arising from the trade-off between more supply (at higher cost) versus less supply (with more frequent outages);

(c) to minimise the gap between actual risk and perceived risk (for example, ensuring there is common understanding of the risk, allowing market mechanisms to work as intended, and minimal need for regulatory or government responses or action outside the processes provided for under the regime) so that the regime isn't undermined by interest groups to compromise the efficiency and effectiveness of the system, ensuring the regulatory and market arrangements are durable.

2.2 The regime does this through ensuring there is sufficient public information on fuel supply to:

(a) Allow participants to make informed risk management decisions, and through financial hedges encourage the supplier (usually a generator) to ensure they have sufficient supply.

(b) Signal to the market the availability and cost of generation, through the price generators are willing to offer their generation signalling the limited availability of resources.

(c) Encourage consumers (especially those exposed to the wholesale price-linked products) to assess the value and make informed choices to use electricity or not.

(d) Signal the need for efficient investment in new generation or demand management.

2.3 The explicit policy settings include:

(a) Reporting by the system operator on the short and medium term availability of fuel through the risk meters, energy risk curves and other regular reports[3], and the long term assessment of generation for forecast demand through the security of supply annual assessment against the security standards[4].

(b) A series of triggers for increasing focus on the amount of fuel available and the risks of running out of storage, with agreed actions at each trigger point.

(c) A formal trigger for an official conservation campaign (OCC), coupled with a dedicated appropriation funded through an industry levy.

[3] See Security of Supply and ERCs and Weekly Summary and Security of Supply Reporting

[4] See Policies, Plans and Publications

(d) A customer compensation scheme (CCS) in parallel with the OCC, to compensate customers for their conservation efforts.

(e) A formal trigger and pre-agreed process for rolling outages if an OCC is insufficient.

(f) A standardised series of stress tests, that must be performed by all wholesale market participants and the results reported to the participant's board.

The first half of 2021

2.4 There was a confluence of factors that lead to prices that were higher than average in the first half of 2021. Those factors included:

(a) Gas supplies were reduced and the spot price for gas was higher than historical averages. This means gas fuelled generators were pricing higher to recover fuel costs.

(b) Carbon prices were nearly $40 per unit, up around 50% from a year previously. As thermal generation pays this cost, it was built into their offers.

(c) Wind generator output was lower than normal for that time of year. As wind generation cannot normally be controlled or stored, it is usually fully dispatched when available, displacing other more expensive generation.

(d) A La Niña year was occurring, and therefore hydro inflows and wind flows were expected to remain lower than normal.

(e) There was lower than normal inflows in the latter part of 2020 and the hydro storage lakes were at lower than normal levels for the start of 2021.

2.5 Starting in February 2021 there was an increasing level of media commentary about potential; hydro shortages, increasing electricity prices and very tight gas supply. By early April 2021 fuel storage almost reached the 1% energy risk curve and there was then a series of small 'inflow events' (rain in the catchment areas) that arrested the decline in storage. In late April storage again started to decline. From 8 May there was significant rain, and this has continued through winter and into spring.

Reviewing the event

2.6 The Authority commissioned MartinJenkins to perform an independent review of the event. The scope, and exclusions of the review are noted in paragraphs 1.4 and 1.5 above and are also explicitly noted in the 'Context' section on Page 1 of the report.

2.7 The review canvassed the views of the major generators and the government. The review has made several findings and recommendations.

2.8 The Authority has already started parallel workstreams to review the detailed policy settings around the stress test regime. We are also working in conjunction with the system operator to review the system operator's security of supply policies. There will be separate consultations on these reviews in early 2022.

Q1. Do you agree with the findings in the MartinJenkins report? If not, why not?

Q2. With regard to the 2021 Dry Year Event, do you have any feedback on:

a) The Authority's actual and perceived performance during the event

b) The system operator's actual and perceived performance during the event

c) The dry year risk regime and incentives

d) The preparedness of the industry (including the Authority)

Appendix A 2021 Dry Year Review Report

MARTIN JENKINS

2021 DRY YEAR EVENT

An independent review commissioned by the Electricity Authority

27 October 2021

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APPENDICES

FIGURES

PREFACE

This report has been prepared for Electricity Authority by Daniel Miles, Bryan Field and Sargam Shah from MartinJenkins (Martin, Jenkins & Associates Limited).

MartinJenkins advises clients in the public, private and not-for-profit sectors. Our work in the public sector spans a wide range of central and local government agencies. We provide advice and support to clients in the following areas:

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- performance improvement and monitoring
- business improvement
- organisational improvement
- employment relations
- economic development
- data analytics
- financial and economic analysis.

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MartinJenkins is a privately owned New Zealand limited liability company. We have offices in Wellington and Auckland. The company was established in 1993 and is governed by a Board made up of executive directors Kevin Jenkins, Michael Mills, Nick Davis, Allana Coulon, Richard Tait and Sarah Baddeley, plus independent director Sophia Gunn and chair David Prentice.

EXECUTIVE SUMMARY

Context

In the late parts of 2020, a level of nervousness began to emerge amongst key players in New Zealand's electricity industry as to the security of energy supply. Sure enough, in early 2021 hydro lake levels continued to trend downwards, toward the official risk lines published by Transpower in their capacity as the system operator.

In March/April, perceived risk had reached the level that a number of deals were struck by generators to ensure security of electricity supply, including the diversion of natural gas from industrial uses towards power generation. Noticeable media and political attention turned to security of electricity supply over this period.

In May the rain came, boosting lake levels well out of any danger zone – and ultimately above where they would normally be expected to be by the latter part of 2021.

The Electricity Authority, in its role as the system's regulator, has commissioned MartinJenkins to conduct an independent review of the dry year event to surface opportunities for system improvement. Our scope included:

- The Authority's actual and perceived performance during the 2021 dry year event.
- The system operator's actual and perceived performance during the 2021 dry year event.
- The dry year risk regime and incentives.
- The preparedness of the industry (including the Authority).

Our scope did not include overarching suitability of market structure or trends within wholesale prices, except in the context of the acute impact of wholesale pricing on securing the outcomes sought by the regime. While the report comments on the political environment in as much as that had an impact on the issues within scope, it does not seek to form judgement on the appropriateness of those political settings – merely their impacts on the issues within scope.

Our scope also did not include the regime's overarching policy purpose. This means that, while industrials did choose to shutter production in order to reduce electricity demand and conserve generation capacity, this is not a system failure and in fact was the system working as intended. Whether the system **should** incentivise conservation to that degree at the levels of risk we saw is another question altogether and speaks to the risk appetite of the Electricity Authority and broader political system as to security of supply.

Findings

The system worked as intended. The 2021 dry year demonstrated the resilience of New Zealand's electricity market mechanisms, even under the added stress of further environmental factors such as gas supply pressures. Water was preserved appropriately through use of alternative generation mechanisms, and the country was retained an appropriate hydro supply buffer to take forward to 2022.

However, no system is perfect. Markets thrive on certainty and transparency, and both could have been improved throughout the 2021 dry year event.
The core guiding policies underpinning the regime effectively gave certainty to market participants, and the system operator executed their duties appropriately under those policies. However, subjective elements in policies have detracted from certainty, as has the perceived potential for political intervention overriding the market regime.

The publicly available risk modelling produced by the system operator provided certainty and transparency around the level of risk that the market was experiencing. However, that certainty was undermined with increasing doubts as to the quality of assumptions around the gas market, two sets of risk curves, and overlapping roles and responsibilities in communicating this information to the Minister. The mandatory information requests issued by the Authority brought some needed confidence as a response, although at the cost of strained relationships with the system operator.

Communications from Transpower adequately followed the policies set out by the Authority, in maintaining transparency of the hydro-shortage risk levels and exercising their duty to produce daily reporting of risk modelling as the risks increased. Political certainty and corresponding public certainty were weaker, partially as a result of unclear roles and responsibilities, and there was an opportunity to do more to explain the impact of market mechanisms to consumers.

Overall, larger market participants were prepared for a dry year and had plans in place to manage the risk. Certainty in market behaviour was undermined by the lack of standing arrangements with gas competitors to reallocate gas to electricity generation in specified situations. The political uncertainty experienced by participants, while ultimately unhelpful for confidence within the market system, was likely a necessary part of ensuring gas could be reallocated from Methanex. Without transparent arrangements to ensure thermal fuels – including but not limited to gas – will be made available in times of high risk, political uncertainty will remain a part of the system.

Both Transpower and the Authority were also prepared for a dry year, but again, with opportunities to improve. Enhancement of policies to remove subjectivity, and to avoid the need for reactive information requests in favour of proactive disclosure in some situations, combined with regular testing of those policies in trial runs would further add to certainty and transparency within the regime.

The general consensus was that the Authority and Transpower were adequately prepared for the dry year, with some opportunities for improvement around subjectivity in policies, communications, and a proactive disclosure regime.

FULL REPORT

Our approach

As part of the services, our report is informed by a document review of the risk regime, incentives and timelines of the events that occurred over the dry year period, and feedback from interviewees with the electricity industry, including but not limited to: MBIE, Transpower, and the Authority.

We have incorporated timelines into our report to understand the full picture of how events have played out over the dry year period along with a recollection of events from the retailer, generator, system operator and Regulator's view.

The process of our review included 24 interviews covering most of the electricity industry to get their perspective on gaps in the dry year risk regime and the preparedness of the Authority and the system operator, while carefully considering the media responses and how justified they were in proportion to the events. The extended interview list is included in Appendix 1.

Findings

New Zealand's electricity sector is, at its core, a regulated free market, relying on market incentives to direct participants towards achieving an efficient and effective market operating in the interests of consumers of electricity. Markets thrive on certainty, which offers participants the confidence to make decisions without needing to include a significant risk premium in their prices.

The 2021 dry year event offers several lessons in the power of certainty in achieving efficient market outcomes. Between January and June 2021 several examples became clear as to how the regime can create the certainty required for participants to act in ensuring security of electricity supply – as well as examples where action or inaction created uncertainty and detracted from the ability of participants to confidently make the choices needed to deliver the outcomes sought by the policy regime surrounding the market.

Environmental factors

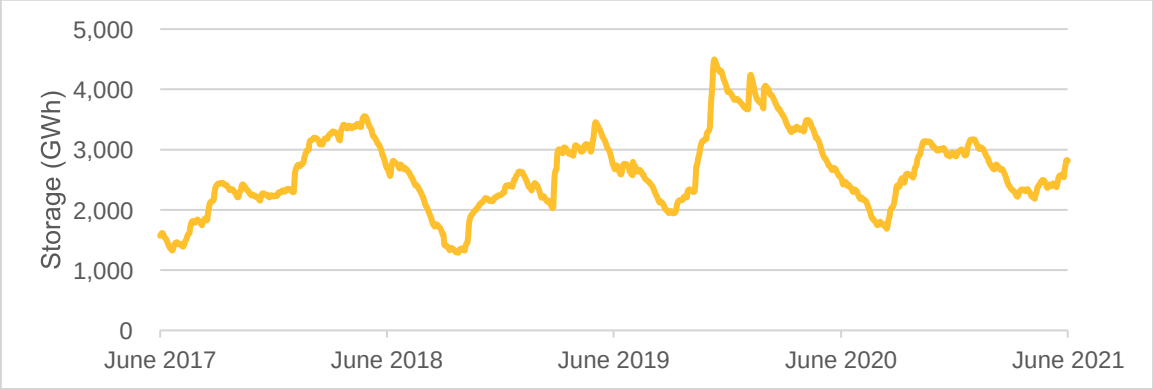
Dry years occur periodically in New Zealand and they always come with some degree of severity given the nation's heavy reliance on hydroelectric power and low levels of hydro storage (compared with other countries). What made this dry year event unlike many in the past was not, in fact, the dryness of the year. Rather, participants saw this dry year event as the perfect storm of several factors, all of which detracted from market certainty:

1 A mild la niña weather system

Traditionally, New Zealand's hydro storage is at its lowest levels around October of each year, before recovering through to around May/June. This pattern began to play out per usual in 2020, but after lake levels recovered sharply from their low by November, they then more or less plateaued through to the end of January without increasing further, meaning we began the year

with a lower-than-expected supply of water in lakes – as shown in Figure 1. This sequence was apparent by November/December, at which point most market participants began to respond.

Figure 1: Four years of hydro storage

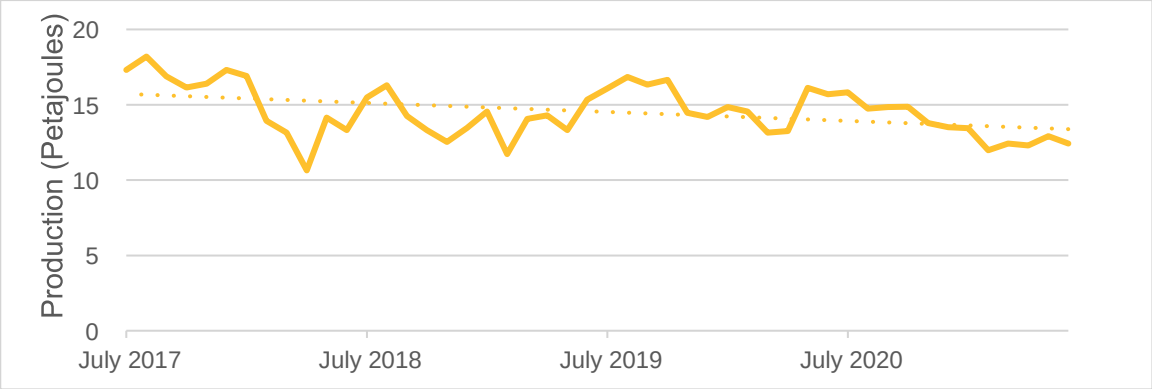


Source: Electricity Authority

2 Shortages in gas supply

Since 2018, production from the Pohokura gas field has been steadily reducing, which added to a level of uncertainty around the availability of gas – particularly for electricity production, where generators must compete with the industrial sector for supply of gas. While gas makes up a relatively low portion (13.8% in 2020) of New Zealand electricity generation[5], it plays a critical role in dealing with demand peaks and providing alternatives when attempting to preserve water for future hydro generation needs. Net monthly gas production in New Zealand is depicted in Figure 2.

Figure 2: Four years of net gas production



Source: MBIE

[5] MBIE, 2021. Electricity webtables. https://www.mbie.govt.nz/assets/Data-Files/Energy/nz-energy-quarterly-and-energy-in-nz/electricity.xlsx

3 **A political environment generating uncertainty around investment in gas production**

Government had expressed a clear desire to transition New Zealand to 100% renewable energy, including ending exploration of offshore gas. The uncertain pace of this transition limited the confidence of the market to invest in development and maintenance of existing infrastructure.

4 **An increased cost of carbon**

This was the first dry year event where carbon pricing had an impact. Increasing reliance on thermal generation fuels such as gas and coal now carried an additional premium over prior dry years, with NZ units trading at up to $40 per tonne of carbon dioxide equivalent (tCO_2e) for most of the period – compared with $20-30 per tCO_2e only a year before.

While all these factors added uncertainty into the electricity sector, none of them were surprises by early 2021. In our view, the industry was as well prepared as could reasonably be expected. It is easy to say in retrospect that the industry should have contracted for greater supply of thermal fuels – but the reality is that those measures to further de-risk a system carry a very real economic cost which would ultimately be borne by consumers.

No system will ever be resilient to any possible circumstance, and the incentive regime and regulatory environment created by the Authority sets a low appetite for risk around security of supply – as can be seen in generators acting to manage risk, preserve water, and negotiate for greater gas availability prior to even reaching a 1% chance of future shortage. Far from demonstrating a fragile system, the 2021 dry year event highlighted a well-functioning market which responded as expected to even minimal levels of risk.

Policies underpinning the regime

Critical to confidence in a regulated market system is a clear set of policies providing an environment in which market participants clearly understand the rules, accountabilities, and consequences embedded within the system.

The primary policy underpinning the supply security is the SOSFIP (Security of Supply Forecasting and Information Policy). In crisis situations, this is supported by the EMP (Emergency Management Policy) and SOROP (System Operator Rolling Outage Plan). In the instance of this dry year event, neither SOROP was not a concern – no participant appears to have ever reached the level of concern that would have seen them considering the impact of rolling outages on their business, so SOROP was largely not considered.

We found that the SOSFIP and EMP was well understood amongst market participants, and supplied a clear, rules-based regime in which participants were able to make choices. It set clear metrics that acted as trigger points for various system actions – such as a switch to daily reporting from the system operator, resource consent triggers for release of water from contingent storage, and commencement of an official conservation campaign. This well-understood regime offered an environment of certainty to the market.

The potential need for an official conservation campaign provided the correct market incentive, with most participants highly conscious of the payment to consumers it would require. This clear financial imperative provided an appropriate incentive on the integrated generation and retail businesses, though this was much more keenly felt by the smaller independent retailers in the market.

This clearly set out policy regime was highly valued by market participants, whose confidence was threatened in the later stages of the dry year event by building media and political pressure. This pressure led several participants to perceive a likelihood of coming political intervention in the market – with one interviewee even raising a perceived risk of price caps being implemented.

The irony of this was that we perceived one of the largest incentives driving the actions of market participants (more than any incentive written into policy) was the preservation of the certainty that rules-based regime provided. If the rules were to be rewritten on the fly, market certainty would have been shattered – and as a result, it seems participants acted earlier and more forcefully than they might have otherwise in order to avoid this risk and ensure that the rules-based regime endured.

There were some features of the EMP which did detract from its otherwise effective provision of market confidence. As an example, the EMP specifies that, should the system operator believe that lake levels are likely to reach the 1% risk curve (the risk curves are discussed further later in this report), then they must begin to provide daily reporting on risk. The clear trigger point of the curve is somewhat undermined by the subjective requirement placed on the system operator to estimate when the event might happen.

This places the system operator in an awkward position – if they make the decision to begin reporting and then the trigger point is not reached, they have sent a signal to the market which ultimately proved unwarranted. If they do not begin reporting, and the risk curve is reached, then they have failed in their duty to pre-empt that event. In this case, they began daily reporting on the 12th of April, only to have rain begin within days and the “watch” curve was never reached.

Our discussions with Transpower made it clear that they took this duty very seriously, and it appears their consideration of when to begin daily reporting was made with an appropriate degree of diligence. The system operator’s role is to execute on the risk appetite of the Authority, as agreed through the EMP, not to determine their own appetite for risk. Making probability-based choices is quite the opposite and requires their own risk appetite to be applied.

While little to no damage was done from the market signal sent in this instance – and in fact, market participants broadly praised Transpower for proactively providing more information – it would be worth considering how much value is gained through these types of discretionary provisions within the EMP to further enhance confidence and clarity of policy within the market – and to remove the onus on the system operator to make forward-looking probability-based choices which are only ever judged with the benefit of hindsight.

Transpower appeared to recognise the need for the Authority to be the one setting risk appetites and checked their choice with the Authority. There appears to have been a breakdown in communication over this though, with the accounts of the Authority and Transpower as to how this decision was approved not reconciling with each other. Therefore, to remove the factor of subjectivity, the Authority should determine their risk appetite and come to an agreement of an absolute value at which point

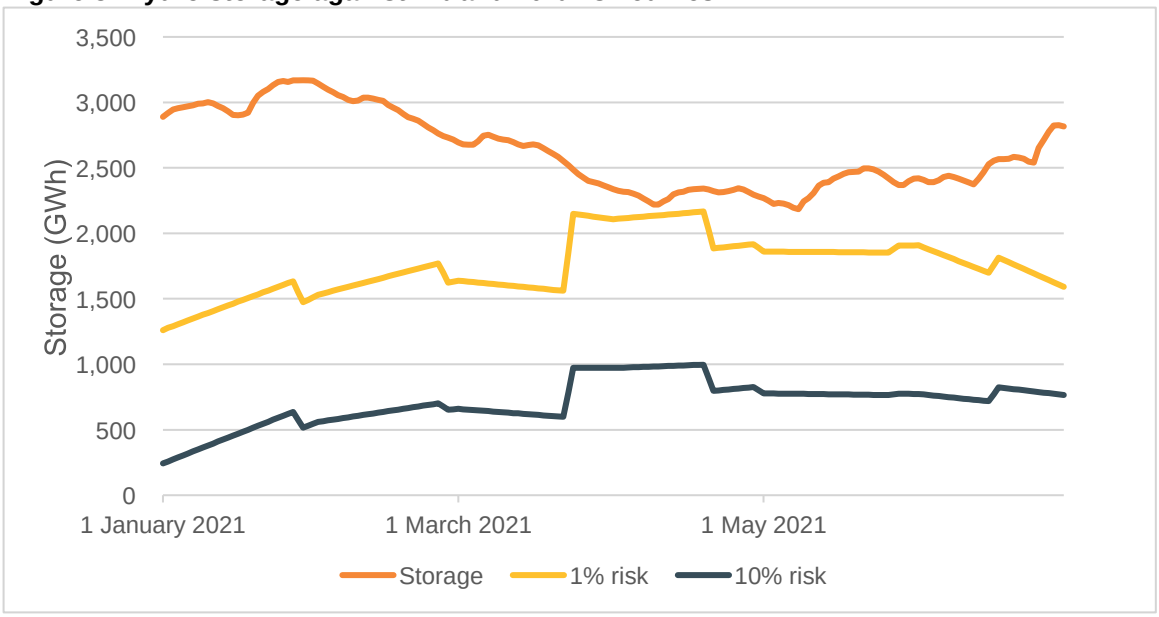
Transpower provides daily reporting instead of transferring that responsibility onto them. If subjective elements remain in the EMP, a more formal consultation process would be appropriate, as 2021 illustrated that an informal process could not be relied on.

Transparency of information

A key feature of the security of supply regime are the risk curves, published by Transpower in their role as the system operator. For over a decade, percentage-based risk curves have been produced. They set out at what level of available hydro storage there would be a certain percentage probability of lakes running out of storage. Percentage risk curves are published at 1%, 2%, 4%, 6%, 8%, and 10% likelihood levels.

As an example, on the 10th of April 2021 (the day on which New Zealand was closest to a risk curve during the 2021 dry year event), slightly over 2,200 gigawatt hours (GWh) of hydro-generation capacity was stored within lakes. On this day, the 1% risk curve was at 2,137 GWh – meaning the probability of future shortage was still under 1%. By way of comparison, the 10% risk curve was set at 984 gigawatt hours – less than half the storage available at the time. These curves are shown in Figure 3.

Figure 3: Hydro storage against 1% and 10% risk curves



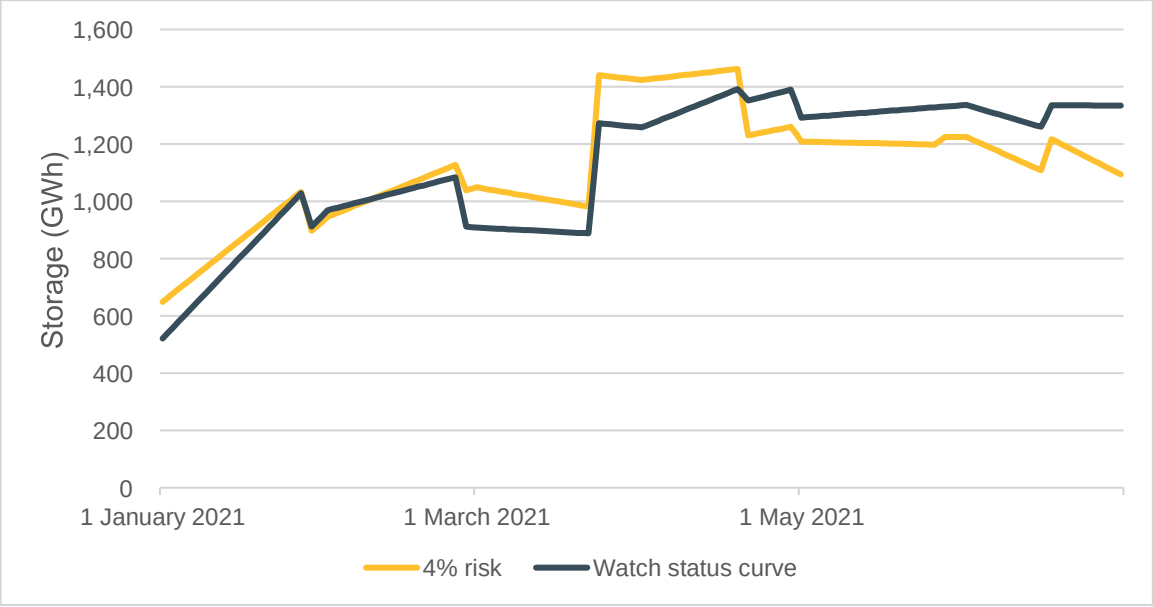
Source: Electricity Authority

We found the percentage risk curves to be broadly accepted and understood in the industry, particularly by the smaller industry participants who were less able to resort to in-house modelling expertise. For the larger generators, they remained important (even if only due to their role in providing trigger points for various responses under the SOSFIP) – but tended to be treated as one of many data points which were considered in planning.

Within the Minister's office, the percentage risk curves were highly relied upon to provide certainty over the security of supply situation, and these curves were also mentioned several times by media during the dry year event.

Following a consultation process, in late 2018 Transpower added an additional step to their modelling, designed to better reflect the availability of thermal fuels such as gas and coal. Additionally, new curves were then produced that added further complexity to the model, which attempted to portray the risk more accurately at any given point in time. These three additional curves were labelled "watch", which corresponded roughly to the 4% risk curve, "alert" (roughly 6%), and "emergency" (virtually identical to the 10% risk curve). To illustrate, Figure 4 shows the 4% risk curve plotted against the "watch" status curve.

Figure 4: Comparison of percentage curve (4%) to status curve ("watch")



Source: Electricity Authority

Stakeholders considered Transpower's modelling of risk as robust – but as with all predictive models, the devil is in the details. While there was a broad consensus from our interviewees that the modelling was robust, questions were raised about the appropriateness of assumptions that were fed into the modelling, particularly with regards to gas availability. The core of disagreement was the distinction between what the industry "could" do, as compared to what the industry "would" do.

Factors undermining confidence in risk curves

The curves in their current form indicate what the industry "could" do and assume that – given a constraint of supply – market dynamics should ensure that thermal fuels are allocated where the market return is the highest, incentivising industrial players to reduce usage in order to profit from onselling their allocation to generators.

In reality, there was scepticism about whether that was realistic. Just as suppliers of gas have forward commitments to supply that gas, consumers of gas also have forward commitments to supply the products resulting from gas consumption – so it was possible that while gas might exist within the system, at no realistic price would it be made available for electricity generation. Questions around these assumptions were actively raised by a number of players over the course of the dry year event, which undermined confidence in the risk curves – particularly among Ministers.
Transparency of information is critically important for market confidence, and the risk curves are one of the primary ways by which transparency of information is achieved in a dry year event. For that reason, it is worth considering what actions are appropriate in order to enhance confidence in the use of those curves.

- **Introduction of the new curves created confusion**

  While Transpower and the Authority were clear on exactly the difference was between the percentage-based risk curves and the new risk curves, we found that none of the generators were. Some interviewees expressed that they ignored the new curves, as they understood the percentages and did not see any need to change.

  There would be value in rationalising the different curves published and focussing effort from the system operator and the Authority on clearly communicating a single set of curves to ensure there is consistency. In the case of the Minister, different stakeholders would refer to different curves at different times, giving an impression of sector confusion when in fact there was none.

- **Ownership of the curves was unclear**

  While there was a clear role and responsibility for creation of the curves, resting with the system operator, there were mixed roles and responsibilities in communicating the curves – particularly to the Minister. This saw MBIE, the Authority, and Transpower all independently at times briefing the Minister on how to understand the different curves, using different language.

  There would be value in agreeing a clear lead for informational resources, particularly for the Minister, to ensure consistency in language and messaging around the risk curves.

- **Sudden curve movements undermined confidence**

  We found that these curve movements were not well understood in the industry, and the sudden shifts in the curves which accompanied updating assumptions gave the impression that the curves were regularly wrong and needing correction – despite the fact vertical movements have been a common occurrence as new information was provided to the system operator.

  There are options for how curves might be stabilised. At the most extreme end, assumptions could be crystallised and never updated. This would rapidly undermine the value of the curves though as they became increasingly out of touch with reality. A better solution would be to recase the entire

curve every time an assumption is updated, moving the whole curve up and down as required and keeping copies of old curves in order to have records of what was known at any given point in time.

If neither option is palatable, then more proactive communication of the assumption changes alongside the presentation of the curves would be valuable.

- **Gas assumptions**

  Many of the key assumptions around gas availability within the risk curves are not public, due to them being based on information provided commercially in confidence by industry participants to Transpower. This non-transparent process allows Transpower to improve the quality of the modelling, at the lowered transparency around process. The majority of industry participants interviewed took the view that Transpower did as good a job as could be expected with their work on the curves, which leads us to the view that, in the eyes of the market, this trade-off is justified.

  It could be mitigated through improved public availability of data on the gas market, which would remove the need for opaque assumptions. However, not all those interviewed agreed there was a shortage of gas information available, with some arguing that it was available, just difficult to find and/or interpret. We lack the specific expertise on gas industry data to confirm or refute either point of view.

  Further to that, this must be read with the proviso that, as part of preparing this review, the Gas Industry Company (GIC) were not interviewed. Regardless, transparency of gas supply data has been well canvassed in fora outside this report, with new legislation and corresponding regulation set to take effect which may resolve this issue in the case of gas, though not necessarily for other thermal fuels such as coal or diesel.

Section 46 notices

As political, public, and industry nervousness increased, the Authority took the unusual step of issuing formal information requests to a number of market participants. These requests are empowered by section 46(2)(a) of the Electricity Industry Act 2010, which allows the Authority to require market participants to provide a wide array of information for a broad set of purposes.

The generators we spoke with took these requests in stride. They were seen as something of a distraction, but part of the cost of doing business. The request to Transpower was, however, slightly more unusual. As the regulator and its contracted system operator, the Authority and Transpower should be in lockstep – particularly so during times of perceived near-crisis. In this instance, sending the Section 46 request to Transpower strained the relationship– undermining Transpower's professional reputation and sending a signal to the market and politically that the regulator and system operator were not on the same page.

However, the Authority appears to have understood the risk taken by issuing the request, and appropriately balanced risks in doing so. From the Authority's perspective, the notices were an attempt to rebuild political confidence – particularly in the risk curves – through radical transparency of information. In doing so, the Authority prioritised political confidence over their relationship with the system operator – possibly a defensible choice given the serious consequences which would accompany a political loss of faith, but one that would be better to avoid in future.

For that reason, there would be value in the Authority and Transpower considering the implementation of an enhanced reporting regime for times of potential crisis. Similarly to how the EMP specifies an enhanced regularity of reporting should risk levels increase, agreement could be reached around increased **depth** of reporting in advance, in order to avoid the need to issue Section 46 requests in future situations.

Communications

In times of increased market risk, the need for communications to be polished and clear is significantly magnified, as this contributes to maintaining confidence in the market.

As lake levels descended towards the risk curves, a moderate amount of media attention began to focus on scarcity of electricity supply in April and May of 2021, with a particular bent towards the high wholesale prices. As the media and the public began to pay more attention, there was an opportunity for the regulatory system to take a stronger voice in reassuring people that both the market was working exactly as intended to preserve resources and ensure security of supply – and that the impact of high wholesale pricing was unlikely to be felt by them.[6]

Roles and responsibilities for communications are set out in a policy agreed between the Authority and Transpower. This policy gives Transpower the lead role in most communications, except for communications to the Minister's office and for spot pricing; most media queries to the Authority are referred on to Transpower.

While Transpower are indeed the experts on technical detail within the system, in our view there is a missing role for more proactive communications on system policy intent and the impact on consumers. A stronger public position could have been taken in the early parts of the year (January – March) to explain to media the emerging dry year situation, and the intended function of the market that people could expect to see (specifically, rising wholesale prices to encourage the conservation of water, and how it would not impact the retail consumer's bills, and that the market was designed to avert the need for conservation campaigns or reduction in home power consumption). We believe this role should likely be filled by the Authority rather than Transpower, as it is both closer to the political sphere and more able to engage in policy discussion, and further distant from market participation.

[6] We note that this was the first dry year event where there was an appreciable number of New Zealanders with exposure to the spot market, through the rise of new retailers which offered half hourly pricing – eg, Flick Electric. This may have played into the media attention in a way not seen before.

Overall readiness

Our final comments are on the overarching preparedness of the Electricity Authority, Transpower, and the market.

Market participants

The generators were reasonably well-prepared. They saw the event coming in the later parts of 2020, and managed their hedge positions deliberately by making minor adjustments and were mainly comfortable that their risk management strategies had allowed for situations such as what we experienced in 2021.

While it would have been pre-emptive for generators to go into every year with a greater precommitment to thermal fuel purchase, there are alternative ways to hedge against the risk of needing thermal fuels without pre-committing to their purchase. We see a potential weakness in the lack of established contractual frameworks to reallocate resources within the gas market. While there were clear agreements in place for demand reduction downstream of the generators, there are not equivalent relationships upstream with competitors for gas. This means that in dry year situations, agreements must be negotiated ad-hoc and there are no standard procedures in place.

This may not be realistic, as companies such as Methanex are ultimately in the business of methanol production, not the business of gas arbitrage and therefore, may be unwilling to enter into such agreements. However, in the absence of agreements such as these, there will remain uncertainty of when the industry will be able to reach agreements on an ad-hoc basis. This adds greater uncertainty to the risk curves and forces individual generators to make risky business agreements under significant pressure (as Genesis did in this instance).

Transparent standing arrangements to reallocate thermal fuels, similar to those which exist for reducing demand, would also remove the current need for political uncertainty in the system (which currently acts as a hedge against the market not responding to reallocation). This would no longer be necessary if clear criteria and contractual arrangements existed to ensure this happened without the threat of political interference.

Our scope did not include consideration of the preparedness of market participants beyond generation. That said, most interviewees we spoke with speculated on the health of hedge positions held by major consumers of electricity, and their subsequent preparedness for dry year events.

System Operator

Transpower were prepared, and by and large seen as a stable pair of hands, competent in executing their role as the system operator. The primary criticisms levelled against them have been discussed elsewhere in this report, but do not revolve around preparedness. They understood the obligations on them according to the SOSFIP and EMP, and were ready to execute on these obligations.

Electricity Authority

The Authority was sufficiently prepared, but with room for improvement. As the owner of the contract with the system operator, any lack of precision within the EMP is ultimately responsibility of the Authority to resolve. Not having a proactive media strategy nor a proactive regime for expanded information disclosure (were the sector to approach crisis) also meant they were left playing catchup with Section 46 notices to attempt to shore up confidence.

The Authority's communication extends to talking about the price environment to the wider industry. Although this role was executed, we think it wasn't executed quickly enough. Our interviewees were concerned about the dry year risk in December, and the stress-tests went out in February. This information could have been especially useful for Industrials who did not have robust risk management practices in place, and would have allowed the Authority to gather insight on stress test results sooner in order to proactively manage risk.

The Authority could further enhance system preparedness through trial runs, similarly to those which the system operator already runs for more acute situations. Regular testing of plans would help ensure that they remain fit for purpose and policy and market structures evolve, as well as ensuring all involved are clear on their roles in executing the plan.
Finally, some interviewees suggested that a high degree of turnover on the Authority board and leadership team since the last dry year damaged its preparedness. While this was a theme from the interviews, we do not see any obvious lack of preparedness, noting that many of these leaders were fresh to their roles but not to the industry.

APPENDIX 1: INTERVIEW LIST

Interviewee	Role	Organisation	Date
Grant Benvenuti	Principal Advisor	Electricity Authority	20/09/21
Heather Roy	SRC Chair	Independent Director	23/09/21
Callum McLean	Senior Advisor	Electricity Authority	23/09/21
Stephen Jay	GM Operations	Transpower	23/09/21
Peter Calderwood	GM Strategy and Growth	Trustpower	23/09/21
David Katz	Market and Security of Supply Manager	Transpower	23/09/21
Daniel Crawshay	Operations Technology and Process Improvement Manager	Transpower	23/09/21
Steve Torrens	Senior Analyst	Transpower	23/09/21
Phil Bishop	Manager Market Analytics	Electricity Authority	24/09/21
Alistair Dixon	Principal Advisor	Electricity Authority	27/09/21
Fraser Jonker	Chief Executive	Pioneer Energy	28/09/21
James Stevenson-Wallace	Chief Executive	Electricity Authority	29/09/21
Charles Teichert	GM Commercial and Strategy	Nova Energy	29/09/21
Matthew Kier	Senior Analyst, Market Analytics	Electricity Authority	29/09/21
Phil Gibson	GM Portfolio	Mercury Energy	30/09/21
Andy Hume	Policy Director	MBIE	06/10/21
Jacqui Nelson	Chief Generation Officer	Contact Energy	30/09/21
Nigel Clark	Chief Operations Officer	Genesis Energy	08/10/21
Chris Ewers	GM Wholesale	Meridian Energy	28/09/21
David Darby	Former Private Secretary to the Minister of Energy & Resources	MBIE	06/10/21

Appendix B Format for submissions

Submitter	

Question	Comment
Q1. Do you agree with the findings in the MartinJenkins report? If not, why not?	
Q2. Do you have any additional feedback on: a) The Authority's actual and perceived performance during the event b) The system operator's actual and perceived performance during the event c) The dry year risk regime and incentives d) The preparedness of the industry (including the Authority)	