

MINISTERIAL BRIEFING

Dry Year Risk Update: Spot market review and other related Authority initiatives

Date:	Mon, 14 Jun 2021	Priority:	High
Security classification:	In Confidence	Electricity Authority reference number:	BR-21-0024

Action sought – Note the contents of this briefing.		
	Action	Deadline
Hon Megan Woods Minister of Energy and Resources	note the work the Authority is doing to review high spot prices and to address security of supply instruct officials from the Electricity Authority to brief your office in more detail	N/A
Appendices included	N/A	

Contact for telephone discussion (if required)				
Name	Position	Telephone		1st contact
James Stevenson-Wallace	Chief Executive	S 9(2)(a)	S 9(2)(a)	
Andrew Doube	General Manager, Market Design	-	S 9(2)(a)	✓
Murray Nash	Specialist Advisor	S 9(2)(a)	-	

Drafter	Eleanor Bell	Position	Policy Advisor, Wholesale Markets
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The following departments/agencies have been consulted
N/A

Minister's office to complete:

- | | |
|---|--|
| <input type="checkbox"/> Approved | <input type="checkbox"/> Declined |
| <input type="checkbox"/> Noted | <input type="checkbox"/> Needs change |
| <input type="checkbox"/> Seen | <input type="checkbox"/> Overtaken by Events |
| <input type="checkbox"/> See Minister's Notes | <input type="checkbox"/> Withdrawn |

Comments

Purpose

This paper updates you on:

- work the Authority has committed to completing by August 2021 on reviewing competition in the spot and forward markets arising from concerns about the high spot prices experienced in 2021 due to dry year risks;
- measures that the Authority and the industry have taken to manage dry year risk, this year and in coming years;
- progress being made to address your request for the Authority to publish more information on wholesale prices [MBIE briefing 2021-3449 refers].

Note the work on reviewing competition in the spot and forward markets is of a highly sensitive nature. The Authority can assist your office in preparing any potential media announcements regarding the scope and progress of the spot market review you may wish to make to manage risks related to commercial and legal sensitivities.

We intend to proactively release a redacted version of this paper.

Summary

In recent months, spot prices have been high in response to security of supply, reflecting low hydro-lake levels, shortages in gas supply and low levels of wind. The Authority has been working with the Ministry of Business, Innovation and Employment (MBIE), and the electricity sector to respond to the emerging issues and ensure the electricity system is future-fit. This briefing updates you on work underway:

1. The Authority is reviewing competition in the spot and forward markets from 2018 to early 2021. Several key events have unfolded in recent years (for example, the 2018 Pohokura outage, the conclusion of negotiations of the contract for supply at Tiwai, and the 2021 dry year event) and these have coincided with high prices for extended periods. A competitive spot price is desirable as it will ensure efficient fuel use decisions. Our review is aimed at answering the question: are spot prices competitive?
2. In response to your request to improve the accessibility of relevant information to the public, the Authority is publishing more information on wholesale market performance. Some of this will be delivered before 30 June 2021, with the rest planned to be in place ahead of winter 2022.
3. The Authority has worked with the sector to manage security of supply this year and into the future. While the settings are generally incentivising participants to manage security of supply, the insights the Authority has gained from its work on responding to the dry-year event have revealed areas where further improvement is likely to be required. The dry-year event highlighted there is a key gap around the Authority's ability to get adequate information about the availability of gas for electricity generation. The Authority will undertake a review and make any necessary changes to regulatory settings and processes.

The Authority will continue to keep you updated as this work progresses, and milestones are reached.

Recommended action

Hon Dr Megan Woods, Minister of Energy and Resources

It is recommended that you:

Review of competition in the wholesale market

1. **note** that competitive spot prices are important for efficient fuel use decisions and high prices are to be expected in times of scarcity
Noted
2. **note** the Authority's review of competition in the wholesale spot and forward markets will ask whether spot prices are competitive and, in particular, seek to understand:
 - a. the contribution of gas risk and carbon prices to electricity prices,
 - b. the Tiwai deal, the market settings that facilitated it and its effect on the investment environment
 - c. the structure, conduct and performance of the spot market
 - d. the forward market and whether expected prices are reasonable**Noted**
3. **note** the Authority's review will be considered by the Board in August 2021, following this it will be provided to you ahead of publication
Noted
4. **note** the review has the potential to have significant implications for the structure of the electricity market.
Noted

Additional work and reporting

5. **note** in response to your request the Authority will publish additional information on the wholesale market before the end of this Winter and will publish further data by the end of 2021
Noted
6. **note** [REDACTED] S9(2)(f)(iv) [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
Noted

Further engagement

7. **instruct** officials from the Electricity Authority to brief your office in more detail on the contents of this report

Agree/disagree



James Stevenson-Wallace
Chief Executive
The Electricity Authority

Hon Dr Megan Woods
Minister of Energy and Resources

14 June 2021

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Background

1. In March 2021, the Chief Executive of the Authority informed you of the measures the Authority was taking to:
 - i. oversee the management of the physical dry year risk situation that was unfolding;
 - ii. provide regular market updates to your office;
 - iii. review competition in the spot market in response to concerns at that time about high prices due to the emerging dry year risk.
2. The Authority is also:
 - i. confirming the right settings are in place to respond to future dry years, particularly as the country transitions to deliver on its climate change objectives;
 - ii. ensuring it, and wider government, can proactively respond to the findings of the review and communicate those findings accordingly;
 - iii. discharging its responsibilities as the lead agency managing the current security of supply situation, and monitoring market participants closely to maintain trust and confidence in the performance of the electricity sector;
 - iv. engaging with sector participants, and gas industry players, and employing our statutory market facilitation functions to protect the long-term interests of consumers.

The Authority's review of competition in the spot and forward markets

3. The Authority committed to reviewing the integrity of the spot prices in response to dry year risk in 2021. The review will cover the period from 2018 to early 2021, this will include examining the high spot prices in early 2021. The high spot prices in recent months have been driven by low hydro-lake storage, tight gas supply and the New Zealand Aluminium Smelter's announcement on 14 January 2021 that it had reached an agreement with Meridian and would remain in operation until 2024.
4. The tight supply conditions have driven the market and physical system to adjust and manage security of supply. However, spot prices remain elevated despite the improvement in hydro storage and a recently announced arrangement between Methanex and Genesis to improve gas availability for thermal generation. In general, the high prices New Zealand is currently experiencing reflect a response to fuel scarcity. However, the Authority is verifying that these prices are being determined through a competitive process. Additionally, the Authority is undertaking analysis to better understand how these spot prices relate to forward prices.
5. The Authority has considered a range of ways to approach the review of competition in the spot market (set out in more detail below). The review will include consideration of the following:
 - i. the contribution of gas risk and carbon prices to electricity prices,
 - ii. the Tiwai deal, the market settings that facilitated it and the effect of the deal on the investment environment. The reason for looking at this is because while that deal might have been commercially rational for the parties, it could point to questions around Meridian's status as gross pivotal generator leading to inefficient outcomes for consumers.

6. Competition in the spot market is important as firms competing to have their generation dispatched should have incentives to put in the lowest cost, most efficient offers possible to meet demand both now and in the future. The price then provides a signal about the relative scarcity of different fuel types, drawing more expensive generation into the system when renewable fuel sources are scarce.
7. Given the forward price is effectively the forward market's best guess at an average future price and the price ultimately converges with the spot price, any inefficiencies in arriving at the spot price will flow through to forward prices. This in turn will impact the effectiveness of the signals the market relies on to make fuel use/store decisions (eg, in renewable generation and demand response, including batteries) and manage price risk.
8. Given the complexity of the issue of competition in the spot and forward markets, the Authority does not expect the review will provide a definitive 'yes/no' answer, but the analysis will suggest where further policy work is required. Some of this policy work may expand beyond the scope of the Authority's current regulatory responsibility (eg, the broader energy sector, and in particular, gas).
9. To manage scope and ensure timely delivery of a useful, practical, and actionable report by August the Authority is actively managing scope creep.

Examining spot prices

10. You have asked about the very high prices seen in the spot market during early 2021. If the spot price is being determined in a competitive environment, then the level is what is required to effectively ration resources. In the case of the 2021 dry season, the price has allowed thermal generation to run and therefore ensure water is rationed. This results in higher-than-average prices because thermal generation has a higher direct cost of generation than hydro. Also, when thermal fuel generation in the offer stack is insufficient to clear the markets, the marginal supplier is often 'reluctant' hydro supply (eg, Taupo), that is hydro fuel by water with very high opportunity cost, given low lake levels and uncertainty around inflows.
11. This then raised the question: are spot prices being formed in a competitive environment? It is this question that our review will shed light on. Ideally, we would like to have directly answered the question whether \$x MWh price is reasonable and can the volatility in prices be explained by generation costs? Answering this question is complex, in large part because the opportunity cost of using water and other fuels is opaque, and in dry years includes a scarcity premium to incentivise demand response. It will be difficult to answer those questions precisely. However, by using a range of indicators and methodologies, this should point to potential competition concerns (if there are any), given different proxies for opportunity cost and scarcity.
12. The review is using a range of indicators to examine the spot and forward market. Consistent with established practice, we have adopted a structure-conduct-performance approach to assess the spot market. Under the structure-conduct-performance approach an industry's performance (and potential benefits to consumers) is determined by the conduct of the firms within the boundaries of this industry, which in turn depend on the structure of the market.
 - i. **Structure** is about market make up and concentration, eg, is the number and relative size of participants enabling them to set prices that are uncompetitive?
 - ii. **Conduct** is about behaviour in the market by these participants, eg, is trading conduct leading to prices that are not competitive?
 - iii. This behaviour is both affected by the market structure and determines market **performance** — the third arm of the test, eg, are generators earning profits that would not be possible in a competitive market.

13. This organising framework allows the interdependencies between these elements to be examined.
14. As part of the spot market review we will be updating and moving beyond the Electricity Price Review (EPR)'s work examining profitability of generators, and examining key events such as the Tiwai smelter electricity supply agreement.

Examining forward prices

15. The forward market establishes prices through a combination of the spot price and expectations of market participants. Having looked at the spot market, the Authority's approach to establishment of prices in the forward market will be to try to assess these expectations so as to seek to understand what is driving prices.

Gas scarcity affects the opportunity cost that thermal generators face, and hydro offers

16. What we have observed so far is that the decline in output from Pohokura means that gas is sufficiently scarce that some industrial users have had difficulty securing supply at any price. The higher the willingness to pay these industrial users have, the higher the opportunity cost of gas is for thermal generators. This means that gas generators face a choice of increasing their offer prices or selling their gas to these industrial users. We believe that gas from the Genesis – Methanex deal has partly gone to industrial users.
17. Hydro generators with reservoirs face a store or generate decision. The opportunity cost of generating is the anticipated cost of purchasing energy at some later date if the reservoir is not replenished by inflows. This anticipated future cost is at least in part determined by the cost of thermal generation. In this way the declining output from Pohokura has affected the offers of hydro generators.
18. This point emphasises the growing importance of gas to security of supply and the pricing of electricity, both during dry years and the transition to 100% renewables. The recent experience with dry year has identified the need for improved information on gas supply for the management of the electricity sector, see paragraphs 39-46.

The review may have policy implications depending on its findings

19. It would be premature to jump to any conclusions on what the review will discover. However, analysis of this type has the potential to identify a variety of issues with the competitive process including, by way of example, barriers to entry or issues as to the impacts of any market power (whether of a short lived or enduring nature).
20. If potential competitiveness issues are identified, there are a range of solutions or interventions that may then be available to address the issues and there may be various options for how such interventions are implemented. For example:
 - i. improving disclosure of information;
 - ii. using the Authority's pre-existing tool kit (eg, through amendments to the Electricity Industry Participation Code 2010 (the Code));
 - iii. further investigation into particular issues (eg, by the Authority or the Commerce Commission);
 - iv. amending the Electricity Industry Act 2010, or other relevant legislation, to address a specific point;
 - v. bespoke remedies of a more structural nature.
21. Penalties and sanctions, such as those available in relation to the new trading conduct provisions, are generally more appropriate for one off or circumstance driven events and are

likely not the focus of this review (although if concerning conduct is found in the course of the review that may warrant a separate investigation). At the other end of the spectrum, if the review identified a more persistent issue or on-going behaviours that impact on competitiveness, that may require a more structural based response to either market make-up, conduct or performance. Such changes could be very significant for the electricity sector.

22. If the review did identify systemic concerns of a structural and enduring nature, it might be that further investigation and analysis of those concerns may then be required to better understand the issue and to reach a firmer view about how such an issue could be best addressed. To this end, the review might identify areas warranting further investigation into both the extent and nature of an issue, its consequences, and consideration of the appropriate policy intervention.
23. Any suggested next steps would be focused on matters that the Authority considers would promote or improve competition, efficiency and overall reliability so as to benefit consumers.
24. Depending on the nature and extent of the review's findings, agencies other than the Authority may need to be involved in the next steps. This could include the Treasury, MBIE, and the Commerce Commission.
25. The results of the review are scheduled to be discussed by the Authority's Board in August 2021 before a final version is shared with your office ahead of publication. The Authority is also undertaking associated work to ensure the electricity market settings promote security of supply.
26. While the study is a critical piece of work by the Authority to ensure the market is delivering long-term benefits for consumers, the review is one part of the Authority's broader work to ensure the electricity sector is future-fit.

The Authority is publishing more information to increase transparency

27. In May 2021 MBIE recommended an option to you in its paper on addressing high spot market prices that "would leverage the [Authority's] current and planned market performance monitoring and reporting activities to improve the accessibility of relevant information to the public" [2021-3449 refers].
28. The Authority has a focus on publishing robust, relevant, and high value information for the benefit of the sector and the public. The decision on which information should be published is supported by robust processes within the Authority. This promotes transparency and gives confidence to the market.
29. In addition to the in-depth one-off commentary of the review, the Authority is also working towards publishing more automated metrics on the wholesale markets via the Electricity Market Information (EMI) website.
30. The Authority's planned monitoring and reporting activities that will be released this winter and can support MBIE's recommendation include:
 - i. information on contract prices as compared to new generation (to deliver on the EPR recommendation D4);
 - ii. information on the weekly water values by reservoir to support the monitoring of the recent Code change on trading conduct [BR-21-0016 refers].

31. By the end of 2021 the Authority's intention is to publish additional metrics around wholesale market performance on EMI. These metrics include information on:
- i. electricity risk and hydro storage – historical risk curve information including risk status curves, contingent storage release boundaries (thresholds at which certain stored hydro is made available for generation to avoid shortage), official conservation campaign triggers, and hydro storage by location and company;
 - ii. marginal generator – the plant used to meet the last MWh of demand (including highlighting the company and fuel type at the margin);
 - iii. gross pivotal generator – a company where if they reduced their offered energy, demand would not be met;
 - iv. sensitivity of price to small changes in demand – highlight the degree to which small quantity changes in demand lead to changes in price and at which locations;
 - v. quantity-weighted offers and offer changes – how much is offered for each generation unit at a particular price and how this changes between trading periods;
 - vi. energy offers adjusted for other factors that limit the ability of the plant to generate and meet their full energy offer (including ramp rates, reserve offers, constraints on offering plant, such as frequency keeping requirements, and, in the case of wind generation, the forecast wind potential).
32. Note that what gets published, and the way it gets published, will need to be in accordance with legal restrictions, such as the parameters under which the information was gathered.
33. The Authority considers this information will address your request to publish further information on the wholesale market in time for the next dry year event.

The Authority will continue to support the industry's initiatives to address security of supply

34. The Authority has engaged with the sector consistently on security of supply throughout the year. It has encouraged and listened to a range of stakeholders and gained a deeper understanding of how participants respond to the incentives in the system.
35. The incentives in the electricity system are designed to deal with dry years and ensure electricity continues to be available and reliable for consumers. Generators are encouraged to manage their fuel so they can continue to generate throughout the dry period, retailers are encouraged to buy hedges to protect themselves (and their customers) from the high spot prices experienced when fuel is scarce, and those who can reduce their demand are encouraged to do so.
36. The recent high spot prices, as well as the incentives on retailers to avoid an official conservation campaign and associated customer compensation scheme, have motivated the electricity sector to mitigate dry year risk. This has culminated in several deals to ensure security of supply through the winter. These deals all occurred ahead of the 1% risk curve being crossed and were in response to the commercial incentives created by market settings. The following agreements reinforce that, in broad terms, the market settings are providing the right incentives for the effective management of security of supply:
- i. **Generation efficiency:** Contact Energy agreed to purchase 3.6PJ of gas from Nova at market prices and sell back a similar volume of electricity that Nova would have otherwise generated through their own peaking plant. The agreement allows gas to be directed to the most efficient electricity generating plant in a period of reduced gas availability.

- ii. [REDACTED] S9(2)(b)(ii) [REDACTED]
 - iii. **Fuel availability:** Genesis reached a two-part agreement with Methanex. It includes a short-term contract for the supply of between 3.3PJ – 4.4PJ of gas [REDACTED] S9(2)(b)(ii) [REDACTED]. Then for 2022 and 2023, Genesis and Methanex have also agreed to a gas swap. [REDACTED] S9(2)(b)(ii) [REDACTED]
 - iv. **Demand reduction:** Meridian Energy (Meridian) and the New Zealand Aluminium Smelter (NZAS) agreed an electricity swap from 28 April to 31 May 2021 in addition to the existing Smelter Demand Response trigger in the electricity supply agreement. The swap allows NZAS to voluntarily reduce its demand by 30.5MWh per hour. Any load reduction voluntarily made by NZAS comes off the total amount of load that NZAS is required to drop should Meridian need to trigger the Smelter Demand Response provisions in the contract as a result of ongoing dry conditions.
37. In some cases, these solutions are negotiated in advance, while others are negotiated as and when required. Largely such deals get formed close to the time they are needed due to the complexity of the deals and cost of negotiating. Having these deals in place provides a framework for future negotiations and more effective management of security of supply going forward.
38. Industrial stakeholders are not naturally in the energy trading business, and giving up gas can have significant operational consequences (eg, closing lines or plants) and cost to their business. The cost of disruption generally needs to be compensated for in any commercial deal to release gas for electricity generation. [REDACTED] S9(2)(ba)(i) [REDACTED]

The Authority is reviewing the security of supply settings as a result of the 2021 event

39. While the existing market settings have provided the right incentives to the sector to manage security of supply, the 2021 event has tested the security of supply management settings.
40. The Authority's section 46 information requests to Transpower, thermal generators and large electricity consumers and Methanex have identified that, in general, the various players have managed the situation appropriately. However, the information collected, and practical experience of the event has identified that some adjustments are likely to be needed.
41. For example, a key issue throughout the event has been uncertainty about the ability of thermal generators to access gas. This includes the terms and circumstances in which this would be made available, and the validity of the assumptions about this availability in the system operator's calculation of energy risk curves (which are triggers for both an official conservation campaign and rolling outages).
42. It has become increasingly apparent that, under current settings and as the country transitions to 100% renewable generation, the availability of gas for electricity generation is essential to New Zealand's security of supply as well as wholesale price setting, particularly in a dry year.
43. However, the Authority is limited in its ability to require information of a standard that is needed to resolve any ambiguity regarding gas available for thermal generation, unless that information is held by electricity generators. That is, the Authority is entirely reliant on anecdotal information and the good will of gas sector players for information critical to

security of supply analysis. The Authority has legislative tools available to compel electricity participants to provide any information necessary to support its monitoring functions; no such tools exist for the gas sector. As New Zealand transitions to 100% renewable generation, information on the gas sector will be increasingly important for the Authority manage, monitor and understand market impacts and security of supply.

44. As a consequence of this year's experience and lessons, the Authority plans to assess the security of supply management settings. This will include reviewing:
 - i. the ability of the Authority and the system operator to access information about gas that has become more critical for assessment of security of electricity supply;
 - ii. the settings for management and forecasting of security of supply by the system operator;
 - iii. the adequacy and warranting of the stress test regime, which tests the ability of purchasers on the wholesale market to withstand extended periods of high spot prices or short periods of extremely high spot prices. The intention of the stress test regime is to provide strong incentives for each wholesale market purchaser to appropriately scrutinise, at governance level, the risk management position they are taking.
45. The Authority intends to complete the assessment of security of supply management settings so that any changes are in place before second quarter of 2022, the most likely time when the settings would next be tested.
46. The Authority will work with the Security and Reliability Council (SRC) as this work develops. This will enable the Authority's analysis and ideas to be tested with SRC to ensure any changes are robust.

Media interest/current issues

47. The communications approach for the release of the review will ultimately depend on its findings. A comprehensive suite of communications material will be developed prior to the release of the review. This will ensure that stakeholders are well informed, and risks are managed.
48. The current holding statement is: In response to increased market volatility and periods of high prices, the Authority is refocusing the review of the wholesale market to assess whether prices in the spot and forward markets are being determined competitively. This will include looking into the structure, conduct and performance of the spot and forward markets since 2018. The review will be released in the third quarter of 2021.

Next steps

49. The Authority will continue to progress the review for completion in August 2021.
50. Within the calendar year the Authority will have addressed MBIE's recommendation around publishing more information on the wholesale market.
51. By March 2022 the Authority will have completed its review of the settings that manage security of supply and made any necessary adjustments.
52. The Authority will brief your office, consistent with the no surprises policy, where relevant.