Contact Energy Submission

Reviewing risk management options for electricity retailers – issues paper

20 December 2024

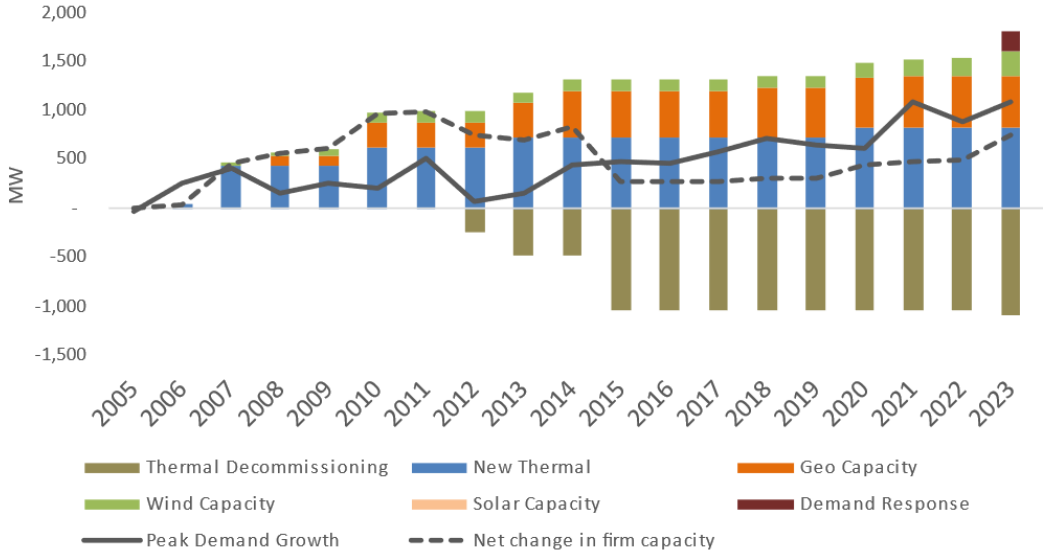
Introduction and Summary

1. Thank you for the opportunity to provide our views on the 'Reviewing risk management options for electricity retailers – issues paper'.
2. While some detailed and careful analysis has been undertaken as part of the issues paper, this analysis has been inconsistently applied to the Electricity Authority's (the Authority) assessment of market power. This has left doubt about whether exercise of market power is occurring, that is not supported by the evidence. This creates a significant risk that the Authority chooses the wrong set of interventions as part of the Electricity Competition Taskforce, and other work the Authority is undertaking.
3. In this submission we show:
    a. clear evidence that there is increasing scarcity of firm capacity. This has occurred for a number of reasons, including upstream gas supply, regulatory changes, demand uncertainty, and disruptions to efficient investment signals.
    b. that the evidence definitively rules out market power as a driver of the tight conditions in the supply of risk management products.
    c. the unintended consequences if market interventions are not well aligned with the evidence and identified problems.
4. At the end of this submission, we also provide a brief response to the post-implementation review of the internal transfer price and retail gross margin.
5. In support of this submission we attach two expert reports:
    a. A report from Sapere that finds very strong evidence that the current challenges in the supply of super peak products are driven by reduced firm capacity in the market relative to demand, and little evidence to support the hypothesis of market power.
    b. A report from competition experts at Bell Gully critiquing the Authority's market definition and the implications this has on whether market power may be a factor in the current challenges in the supply of super peak products.

The evidence points to scarcity driving the tight supply of super-peak hedges

6. As shown in the attached report from Sapere, capacity of firm electricity has not kept up with increases in peak demand in recent years. This is demonstrated in the figure below from the Sapere report:

Figure 1: Changes in firm winter capacity vs growth in peak demand 2005-2023



Source: Analysis provided by Whiteboard Energy

7. This has occurred for a number of reasons, principally:

    a. increasingly murky investment signals due to the suppression of prices at peak times (see p3 of Sapere report);

    b. the removal of RCPD incentives as part of the transition to the transmission pricing methodology, which increased peak demand by about 150MW (see pp10-11 of Sapere report);

    c. a reduction in gas capacity (see pp 10-14 of Sapere report);

    d. uncertainty regarding government intervention, such as the NZ Battery Project, and the 100% renewable by 2030 target (see pp14-15 of Sapere report);

    e. the demand uncertainty driven by the threat of exit of the New Zealand Aluminium Smelter (NZAS) (see p15 of Sapere report). This was only resolved at the end of May this year.[1] If NZAS exited then there would have been no need for investment in firm capacity for a decade or more. No prudent governance board would agree to significant investment in firm capacity in that environment;

    f. the impact of the Ukraine war on international fuel prices (see p15 of Sapere report); and

    g. heightened lithium prices, particularly in the aftermath of the COVID-19 pandemic (see pp16-17 of Sapere report).

[1] https://contact.co.nz/aboutus/media-centre/2024/05/30/nzas-to-stay-for-the-long-term

8. As shown by Sapere elsewhere, it is very likely that the capacity of firm electricity in the New Zealand market now falls below a prudent capacity margin.[2] It is therefore clear that firm capacity is a real challenge for the New Zealand market, and that it has been driven by factors outside of the control of market participants.

10. Within a context of scarcity generators can only sell super-peak contracts if they have sufficient generation capacity to mitigate the risk of high peak prices. If there is no certainty of generation capacity then it is just a straight transfer of risk, and that will of course attract a significant margin.

11. Most of Contact's flexible generation comes from aging thermal plant. These plants are prone to outages,[3] and fuel supply can no longer be relied upon.[4] That means Contact often cannot confidently sell super-peak capacity until closer to real time. We acknowledge that is not optimal for independent retailers. However, this will only be resolved by addressing the underlying scarcity problem. Attempting to use blunt regulatory mechanisms to force increasingly risky trades will ultimately harm efficiency and security.

Market power can be definitively ruled out

12. In Chapter 7 the Authority was unable to definitively rule out that market power may be contributing to the tight supply of super-peak hedges. We do not consider that this finding is consistent with the evidence.

13. The Authority identifies the following four conditions that it considers must hold true for a gentailer to hold market power in relation to risk management:

    a. Shaped hedge contracts are a necessary aspect of efficient peak time risk management

    b. Having flexible generation and fuel is a pre-requisite to sustainably offering those shaped hedge contracts

    c. There are high barriers to building new flexible generation capacity for all participants, including gentailers

    d. Gentailers have the ability and incentive to individually influence the price or supply of hedge contracts, for reasons other than fuel scarcity, despite there being other suppliers and/or substitutes.

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[2] https://srgexpert.com/wp-content/uploads/2024/12/Confluence-of-factors-threatening-electricity-reliability-3-September-2024.pdf
[3] https://contact.co.nz/aboutus/media-centre/2023/09/05/peaker-gt22-suffers-significant-internal-turbine-damage
[4] https://www.nzx.com/announcements/427586

14. The evidence shows that none of these conditions are met. Therefore the Authority can definitively rule out market power as a factor in its response.

The market for risk management is much broader than OTC hedge contracts

15. Conditions a. and b. above both rely on narrowly defining the market for risk management products to just OTC hedge contracts.

16. This is inconsistent with the well-considered assessment of the market for risk management during super peaks in chapter four. In that chapter the Authority finds that:

> A portfolio of baseload and super-peak hedges has some risk management options that appear to be closer substitutes, including:
>
> i. A portfolio of baseload hedges and peak hedges
>
> ii. A portfolio of baseload hedges and cap hedges
>
> iii. A portfolio of baseload hedges and demand response
>
> iv. A portfolio of baseload hedges and retail tariffs
>
> v. A portfolio of baseload hedges and virtual battery services or investment in batteries[5]
>
> …
>
> The current use of alternatives also suggests a wider market than OTC superpeak hedges alone[6]

17. We agree with this finding. We also consider that further refinement of the Authority's analysis would show that these products are even closer substitutes than presented in the issues paper. In particular, we have identified the following adjustments that should be made:

    a. It appears that the modelled OTC product contains no risk margin. Our understanding is that what is presented is as if there was a perfect hedge reflecting average spot shape. As the Authority showed in Attachment A, and further discussed by Sapere there are a number of legitimate reasons why a risk margin is appropriate. We consider that

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5 https://www.ea.govt.nz/documents/5980/Reviewing_risk_management_options_for_electricity_retailers__issues_paper.pdf, p42.

6 https://www.ea.govt.nz/documents/5980/Reviewing_risk_management_options_for_electricity_retailers__issues_paper.pdf, p49

adding a nominal risk margin would better reflect the likely cost of an OTC super peak product

b. The analysis of batteries looks largely accurate. However, we consider that the Authority should update the round-trip efficiency from 80% to 85%, as is common industry practice.

c. There are some unintuitive results for some of the risk management tools. For example we are unsure why geothermal is materially worse than a baseload contract, and why a battery and demand response alone are worse than being unhedged. Some reasonableness cross checks may help refine the Authority's modelling.

18. Despite this careful analysis strongly pointing to a broad market definition, the Authority has chosen to narrow its market definition to just OTC hedges, excluding other sources of supply, and other types of hedge contracts, such as a full retail shape. The Authority justifies excluding substitutes such as this on the basis that some of the substitutes, such as demand response and grid scale batteries are new to the market.

19. We do not consider that the Authority's justification for excluding the wider substitutes it has found is robust. As noted by Bell Gully:

> the EA notes that these products are currently used as part of non-integrated retailers' risk management portfolios. Accordingly, these products cannot plausibly be excluded from the relevant market on the basis that they are nascent, because they can, and already do, constrain the prices of other risk management products.

20. We therefore consider that the Authority has reached an unduly narrow market definition. We consider that applying the wider market demonstrated by the Authority's analysis would produce a more robust test of market power.

21. Applying the more analytically robust wider market definition will also help with assessing the best set of interventions. It is well established in the literature and practice that competition from substitutes is a much better outcome for consumers than restrictive regulations. Typically a regulator seeing a competitive threat on the horizon would focus efforts supporting those innovations to market. As we cover in the final section of this submission, some of the market power 'solutions' considered by the Authority may have the opposite effect, dissuading parties from building firm capacity, and making the underlying scarcity problem worse.

22. It is therefore clear that a proper market definition must incorporate the wider substitutes identified by the Authority, and conditions a. and b. are not met.

There is a very real likelihood of entry, and actual examples of it occurring

23. Condition c. above relies on there being high barriers to entry. But with the corrected market definition it is clear that this is not true.

24. There has been substantial investment undertaken in grid scale batteries both by incumbents and new entrants. WEL, Meridian, Contact, and Genesis currently have grid scale batteries either commissioned or under construction. A number of other grid scale batteries are also being investigated, such as by Mercury, NZ Clean Energy, Ethical Power and Kea-X. Contact is also exploring a second battery based on a 'virtual battery' service model, where it would contract out this capacity to other parties looking to gain another source of flexibility in their portfolio.

25. There has also been significant entry in demand response. Contact is one of the market leaders in demand response, including residential time of use plans, hot water control, and commercial and industrial demand response under its Simply Energy Brand. Ohers in the industry are also investing in demand response, such as Octopus' 'Saving Sessions' offer.[7]

26. The Authority does not consider the ease of entry for batteries and demand response as a material constraint because some of these products are relatively new to the market. However, as identified by Bell Gully:

> The electricity market is dynamic. Accordingly, new entry (in particular, batteries and demand response) is certainly relevant to determine the relevant market definition, particularly in the context of assessing the potential existence of market power. Price increases spur new entry in these types of products by both incumbents and non-incumbents, which is playing out in practice. Accordingly, the EA's assertion that these products may not yet be able to discipline the prices of shaped OTC hedge contracts is, in Bell Gully's view, not well founded.

27. This was also noted by MDAG who found that "the shift to a renewables-based system may strengthen competition in some areas. For example, the expected widespread deployment of chemical batteries appears likely to increase competition in the provision of short-duration flexibility (a day or less)".[8]

28. We also question some of the reasons the Authority has given about the limited role of grid scale batteries and demand response in the risk management market and note that some of these limitations are within the Authority's control to address.

29. Regarding grid scale batteries the Authority found:[9]

    a. that batteries have finite storage capacity – however, we consider that properly functioning market signals will address this by incentivising the right level of investment to meet needs within the technical limitations

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[7] Octoplus Saving Sessions | Octopus Energy

[8] https://www.ea.govt.nz/documents/4335/Appendix_A2_-_Final_recommendations_report.pdf at paragraph D.4.

[9] https://www.ea.govt.nz/documents/5980/Reviewing_risk_management_options_for_electricity_retailers__issues_paper.pdf, p65-66

b. that it is difficult to predict the tails of spot price distribution – we consider that this will be addressed by a strong market incentive to get this forecasting correct. However, as noted by Sapere there may be some regulatory factors that are weakening market signals. It is within the scope of the Authority to address these problems, rather than highlighting them as insurmountable barriers.

c. that market design may "currently impose limitations on the use of batteries for risk management". Again it is within the Authority's power to address these issues. We are actively working with the Authority on addressing these problems, and we encourage the Authority to place a higher priority on this crucial work.

d. that there are some technical challenges in offering batteries into some reserve markets. Again this is within the Authority's remit to address and is not an unsurmountable barrier.

30. Regarding demand response the Authority found:[10]

a. that there is residual spot risk even if demand response is called. However, we note that effective demand response can mean that the remaining load can more closely resemble baseload supply, of which there is ample supply.

b. that seasonal demand response may only be available to retailers with large commercial and industrial customers. However, seasonal capacity is not the focus of the market issue identified in this work.

c. that there are challenges in in working with electricity distribution businesses to efficiently utilise hot water control. We agree that this is creating unnecessary friction. This issue has been before the Authority for a significant period with minimal progress. We encourage the Authority to place greater priority to this work.

d. that there are questions around whether the market sufficiently rewards commercial and industrial demand flex. Contact has provided a number of submissions highlighting this challenge and solutions that the Authority could implement to provide a stronger signal. To date these potential solutions have not been adopted on the basis that they are unnecessary. This seems inconsistent with highlighting this as a reason why demand response is not an effective constraint on the market.

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10 https://www.ea.govt.nz/documents/5980/Reviewing_risk_management_options_for_electricity_retailers__issues_paper.pd, p63-64.

31. Overall we consider that the evidence shows that both grid scale batteries and demand response are effective substitutes with low barriers to entry. On that basis condition c. is not met.

There is strong evidence showing gentailers do not have the ability or incentive to influence the price or supply of OTC super peak contracts

32. Condition d. tests whether gentailers have the ability and incentive to influence price or supply of super peak hedge contracts, for reasons other than fuel scarcity, despite there being other suppliers and/or substitutes. The Authority is unable to definitively rule this out:

> What appears to be a sensible justification from one perspective (scarcity could be the driver of the indicators noted in 5.3), could be a convenient excuse from another. The evidence we have seen to date does not clearly prove either perspective, so we consider it is important to contemplate both perspectives in any policy response.[11]

33. The Authority has not produced evidence supporting the possibility of market power. Instead the Authority points to two areas where it has not been able to gather evidence:

    a. The Authority notes that there is a margin on super-peak products above the shape margin observed in past spot prices. While the Authority identifies a number of reasons why a margin is legitimate, however, it was unable to quantify them. As noted by Sapere "[a]bsent accurate estimates of these premia, commentary as to whether observed prices or terms for super-peak hedge contracts are impacted by market power becomes speculative."

    b. The Authority also found that some requests for super-peak hedges were not responded to, or there were non-conforming offers. In Contact's case this can always be explained by fuel conditions. The Authority should not expect gentailers to act in an insurance capacity if they do not have sufficient certainty of generation to cover the risks. The Authority says they "cannot form a definitive conclusion on this being the main drivers of all refusals or non-confirmation". Yet, the Authority have not engaged with us to better understand those instances where we had refused supply or provided non-confirming offers.

34. The Authority could have also assessed whether super-peak contract prices are aligned with the cost of new entry into capacity like grid scale batteries and demand response. As noted by Sapere, "If peak prices in the spot market are

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11 https://www.ea.govt.nz/documents/5980/Reviewing_risk_management_options_for_electricity_retailers__issues_paper.pdf, p114.

insufficient over time to attract and maintain peak capacity, the Authority can be confident that market power could not have been in play".

35. On the other hand there is very strong evidence showing that there is not, nor is there any likely prospect of market power driving the tight supply conditions of super-peak contracts. Some of the main pieces of evidence against there being any market power are covered below.

Unilaterally reducing supply or increasing prices of super peak contracts would require a high level of coordination amongst competitors

36. There are four independent gentailers plus Nova that actively supply super-peak products. As noted by Bell Gully:

> we consider the EA incorrectly focusses on market power of "the gentailers" as a collective, rather than recognising these are separate (and vigorous) competitors.

37. Each of these companies have different incentives and opportunities, because each one has a different generation portfolio and existing contract commitments. As noted by the Authority "Each gentailer seems to approach this market differently, and this is reflected in the different ways they respond to RFPs." Gentailers do not act homogenously, and if underlying scarcity was addressed, then any attempt to manipulate prices or supply by one player would easily be exploited by the others, as in any competitive market.

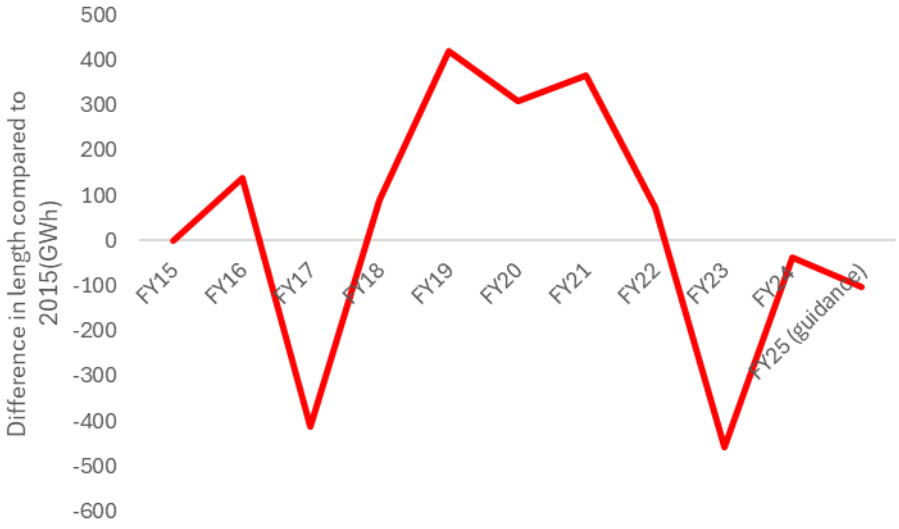
Reducing supply of super peak contracts would require increasing spot exposure

38. Attempting to reduce supply of super peak contracts (ie a foreclosure strategy) would require generators to take on additional spot exposure. Foreclosure occurs when a product is available, but not sold. If peak capacity is available but contracts are not sold, then a generator will be left earning volatile spot revenue. As noted in a recent report from Jarden, increasing exposure to volatile spot market revenue puts the entire 'low-risk' gentailer model at risk, and would harm our ability to access capital to support our investment programmes.[12] Any perceived gains from a foreclosure strategy would be swamped by this negative consequence.

39. If gentailers were increasing spot exposure to foreclose the supply of super-peak products then an increase in merchant length would be observable in the data. We have undertaken this analysis for Contact energy in figure 2 below and see no evidence of a systematic increase in length since 2015.

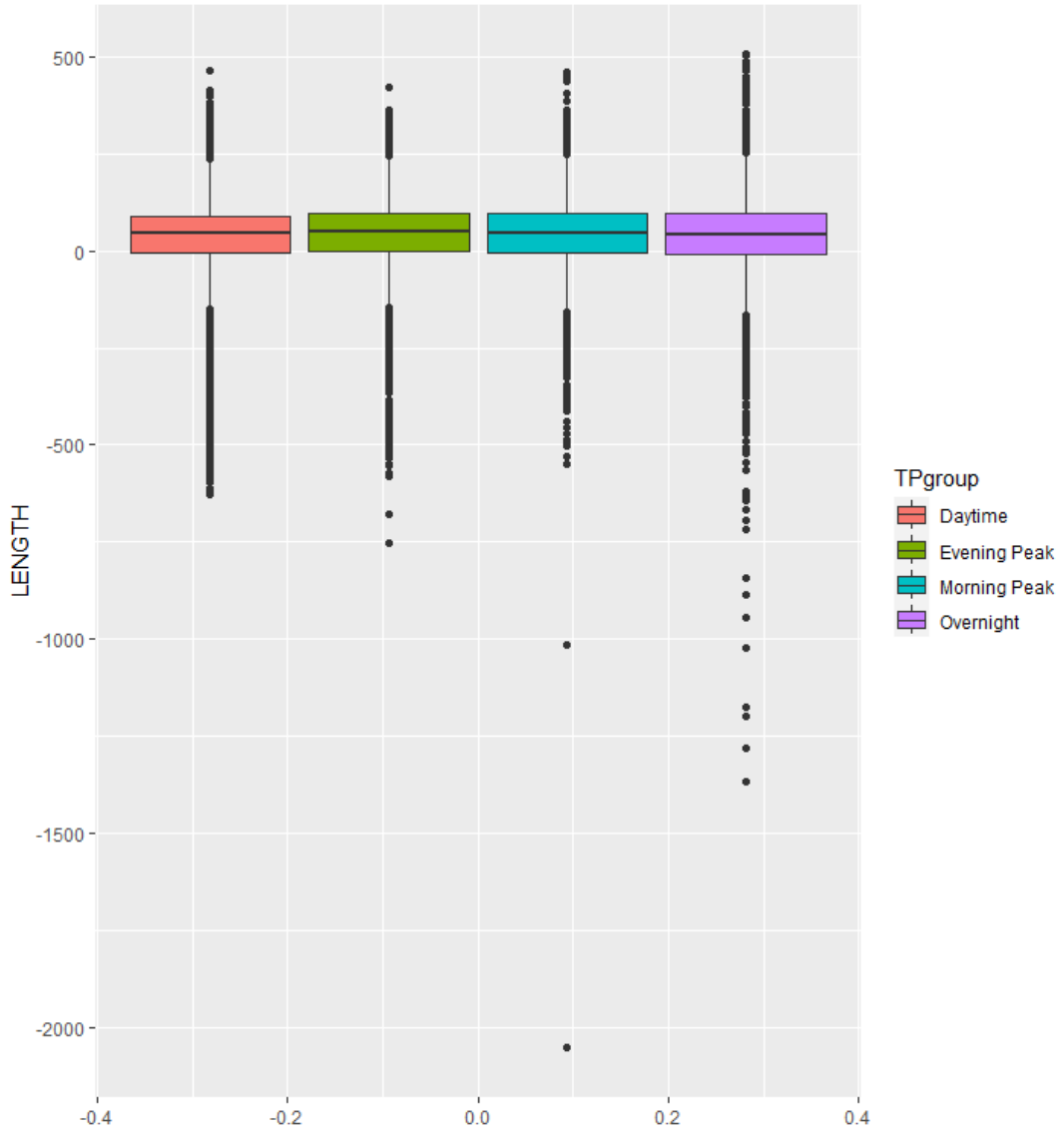
[12] https://businessdesk.co.nz/article/markets/electricity-sector-warned-to-sort-fuel-problems-or-face-the-consequences

Figure 2: Contact energy merchant length compared to a 2015 base year



40. We have also assessed Contact's length at different times of the day in figure 3 below and find that it is similar for super peak periods as it is in other periods of the day, further indicating that foreclosure of this period is not occurring.

Figure 3: Contact Energy Contract length at different times of the day[13]



41. The Authority notes that it does not observe unused capacity in the spot market, or gentailer appetite to have uncontracted load, but appears to miss the practical implication that this is strong evidence against foreclosure, at least in the short term.

Investment is underway to increase superpeak capacity

42. A firm attempting a long-term foreclosure strategy would not grow its capacity of that product. This is not what the evidence shows in the electricity market where there is substantial investment underway in increasing firm capacity. Contact alone is currently commissioning 225.4MW of baseload geothermal generation

[13] This data covers the three-year period from November 2019 to October 2022. We used this period to avoid the additional complexity of real time pricing that came into effect in November 2022. There is also no reason to expect that this finding will be different for more recent data.

and has made investment decisions in a further 101MW of geothermal,[14] and a 100MW grid scale battery.[15] As noted by the Authority, Contact is also exploring a second battery based on a 'virtual battery' service model.

43. The list of other market participants that have either commissioned, or are actively exploring battery investments is long, including Waikato Electricity Lines, Meridian, Genesis Mercury, NZ Clean Energy, Ethical Power and Kea-X.

44. The industry is also investing in demand response solutions to reduce peak demand requirements. For example Contact's electricity supply agreement with NZ Steel will see 30MW of capacity freed up to the market in morning and evening peaks. As noted by the Authority, Contact is also rapidly expanding its 'hot water sorter' product to reduce peak residential load, alongside its industry leading 'good' plans. These actions are not consistent with any attempt to reduce the supply of super-peak capacity.

The Authority's analysis shows that substitutes are effective at constraining prices

45. Condition d. seems to acknowledge that substitutes are possible (inconsistent with the findings on conditions a. – c.). However, it seems to conclude that gentailers can raise prices despite these substitutes. This conclusion is not supported by the Authority's own analysis. In chapter four the Authority undertakes a SSNIP test to assess the impact of changing the price of OTC super-peak hedges. While some compromises were made in this assessment given data limitations, we consider that this analysis is a good indication of the competitive threat from substitutes.

46. The Authority's application of the SSNIP test found that: "a price increase for OTC super-peak contracts would result in customers switching to alternatives".[16] We consider this to be an important finding that should be given more weight by the Authority. Further, if the adjustments suggested earlier in this submission were made the substitutes would be even closer than in the Authority's analysis, showing that there is an even greater level of constraint.

Favouring long-term large volume retail load is not evidence of constraining supply

47. In numerous places the Authority asserts that gentailers favour supplying to their own retail arms. We do not consider that this is wholly accurate. It is more accurate to say that generators favour long-term large-volume low-risk load to increase their revenue certainty. Currently our retail arm is one of the best

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[14] https://contact.co.nz/-/media/contact/mediacentre/2024/contact-invests-to-redevelop-wairakei.ashx?la=en

[15] https://contact.co.nz/aboutus/media-centre/2024/06/30/contact-to-develop-a-gridscale-100-mw-battery-in-auckland

[16] https://www.ea.govt.nz/documents/5980/Reviewing_risk_management_options_for_electricity_retailers__issues_paper.pdf, p46.

sources of this type of load, but we treat all counterparties with similar attributes the same as our retail arm. We note that this same outcome would be likely to occur if gentailer's retail and wholesale arm were structurally separated.

48. Generators are a very capital intensive business. To put this into context the investments that Contact Energy and its partners have made into new generation assets since 2019 is over $2.3b. This is substantial in comparison to other major infrastructure investments in New Zealand, such as the Te Kaha Stadium in Christchurch at $683m, Transmission Gully at $1.25b, or the Auckland Waterview Tunnel at $1.4b. Contact is not alone, this unprecedented level of investment is happening across the sector.

49. Supporting this level of capital investment requires careful cashflow, and risk management to ensure ongoing access to low-cost funding. Favouring long-term, large-volume, low risk load helps gentailers achieve this outcome.

50. Therefore, simply observing that we ensure our retail load is met before considering how much load to offer to other parties is not evidence of foreclosure. It is simply a reflection of a prudent risk management strategy.

Conclusions regarding the potential for market power

51. The Authority's views on market power appear to reach an a priori conclusion. It is not consistent with the Authority's own analysis, no evidence is presented to support the conclusions reached, and the strong evidence demonstrating market power is not at play is not fully recognised.

Market interventions must be well aligned with the evidence

52. The evidence points to scarcity of firm capacity driving the tight conditions in the supply of super peak products. We consider that this has implications for what interventions are likely to be successful, and those that are likely to have unintended consequences.

53. The interventions likely to be more successful will focus on bringing more firm capacity to the market. In this regard we want to particularly highlight the importance of the recently developed standardised flexibility product. We fully support the development of this product, and expect that it will be actively traded, as there is a clear need across the market. This will enable price discovery of super-peak energy, and provide a clearer signal to the market to support investments into flexible capacity like grid scale batteries and demand response.

54. However, we consider it important that natural buyers and sellers of the super peak product are allowed to emerge. For example, some gentailers with finite hydro or thermal capacity that are looking to integrate wind or solar into their

portfolio may be natural buyers. If interventions force all larger participants to be net sellers, it may result in the product being under-valued as key demand participants are absent. This may ultimately undermine the investment signal for firming capacity, and slow down investment in intermittent renewables.

55. Other interventions that may bring more firm capacity to the market include:

    a. Ensuring that there are sufficient price signals to support investment in firm capacity. As noted by Sapere prices will be efficient when they align with the cost of investment.

    b. Addressing the technical matters that limit the effectiveness of grid scale batteries.

    c. Measures to improve the uptake of demand response. Including stronger measures to ensure EDBs cooperate with efforts to more efficiently utilise hot water control, and better market signals for commercial and industrial demand response.

    d. Strengthening the Security and Reliability council to better understand the constraints facing the market, and what solutions there may be.[17]

56. On the other hand if interventions are developed to address market power, when in fact no such market power exists, it has the potential to create perverse outcomes, harming efficient market incentives, reducing investment, and ultimately reducing security of supply. For example:

    a. Interventions that create preferential treatment for some segments of the market are likely to harm efficient allocation of resources, and investment signals. For example, Taskforce option 1A to Consider requiring gentailers to offer firming for Power Purchase Agreements.

    b. Interventions that dictate a certain volume of a product is provided to the market are likely to distort offer behaviour. For example the threat that market making will be required on the recently developed standardised super-peak product. As noted by Sapere this may unnecessarily increase risk for market participants and deter new entry if it is implemented before the underlying scarcity problem is addressed.

[17] https://srgexpert.com/wp-content/uploads/2024/12/Strengthening-the-Security-and-Reliability-Council-3-September-2024.pdf

Response to Post Implementation Review of Internal Transfer Price and Retail Gross Margin

57. Finally we would like to provide some brief comments on the post implementation review of the internal transfer price (ITP) and retail gross margin.

58. Contact Energy began publishing data on the profitability of its retail arm well ahead of the regulatory requirement to do so. We consider it is important to improve transparency, and assess performance of our retail arm.

59. The ITP is an important part of this transparency. While the ITP is not on its own determinative of retail prices, it is one of the key inputs we use, alongside changes in other input costs, competitor pricing, and the impact on consumer hardship. We will also consider the long-term trends of all our input costs to not over-react to short-term fluctuations, and smooth transition paths for consumers.

60. We therefore support the continued use of the ITP and Retail Gross Margin as a key indicator of long-term retail competitiveness. However, we also support work to assess whether there needs to be tweaks to improve its effectiveness as a comparison tool.

61. However, we do not support having a set of detailed rules on segment reporting and how common costs must be allocated. This will simply add unnecessary costs to the business with no benefit to customers.

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Submission on the Electricity Authority's issues paper dated 7 November 2024 - "Reviewing risk management options for electricity retailers"

1. Introduction

1.1 The Electricity Authority Te Mana Hiko (**EA**) has published an issues paper which sets out its preliminary findings from its December 2023 risk management review to test whether the availability of over-the-counter (**OTC**) risk management contracts is creating a barrier to entry or expansion in the retail electricity market, and therefore harming competition (the **Issues Paper**).

1.2 We act for Contact Energy Limited (**Contact**). Contact has asked Bell Gully to comment on specific matters in the Issues Paper. In particular, we have been asked to comment on the appropriateness of the EA's approach to defining the relevant market within which to assess whether one or more suppliers may be exercising market power in the supply of risk management products. In doing so, we draw on our experience from a competition law perspective in defining markets, as relevant to market power matters.

2. Market definition principles

2.1 As the EA has recognised: [1]

> *any discussion of the potential exercise of market power necessarily entails at least some consideration of the specific market in which the conduct is occurring.*

2.2 We agree with this statement. Indeed, market definition is a crucial aspect of determining whether any market participant could exercise market power. As the EA rightly notes:[2]

> *an overly narrow approach to market definition risks overestimating the extent – and potential impact on competition – of any market power. Correspondingly, an overly wide approach to market definition risks underestimating market power and its impacts on competition.*

[1] Issues Paper at Chapter 4, [3.3].
[2] Issues Paper at Chapter 4, [3.3].

2.3 The Commerce Act (the **Act**) defines a market as "a market for goods or services as well as other goods or services that, as a matter of fact and commercial common sense, are substitutable for them." As the EA has recognised, this involves assessing both demand-side substitution (i.e., the likely reaction of *customers* to price increases by switching to alternative products) and supply-side substitution (i.e., the likely reaction of *suppliers* to price increases by switching from the provision of other products to the product in question).

2.4 The EA has correctly identified the hypothetical monopolist test (or the 'SSNIP' test) as being relevant to determine whether products are sufficiently close substitutes (and therefore whether products can be properly considered to be within the same market). As the EA notes, this test involves considering whether a hypothetical monopolist supplier of a specific product would be able to profitably increase prices by a small but significant, non-transitory amount (typically 5%). In general, the relevant market is the smallest group of products in which the SSNIP can be profitably sustained.

3. The EA's approach to defining the relevant market

3.1 The EA's analysis tests the extent to which a 5% price increase results in shifting demand between competing risk management products, focussing on the substitutability between a portfolio of baseload and super-peak hedges and other alternatives. This is broadly consistent with the market definition principles set out above.

The EA's analysis appears to suggest the relevant market is broad

3.2 The EA's analysis indicates that a portfolio of baseload and super-peak hedges has some risk management options that appear to be closer substitutes, including portfolios consisting baseload hedges and:

(a) peak hedges;

(b) cap hedges;

(c) demand response;

(d) retail tariffs; and

(e) virtual battery services or investment in batteries.

3.3 While the EA's modelling suggests that certain possible substitutes for OTC super-peak hedges are more closely substitutable than others, the EA notes that all possible substitutes are already being used as part of non-integrated retailers' portfolios and are therefore viable substitutes for OTC super-peak hedges:[3]

> *all options listed as possible substitutes are already being used as part of non-integrated retailers' portfolios for risk management (except for virtual battery services, although an EOI for this service garnered a lot of interest). This provides evidence that these options are to some extent viable substitutes for OTC super-peak hedges, especially if used as part of a portfolio of options.*

3.4 The above analysis seems to support a broad market definition which is consistent with previous NZCC precedent.

[3] Issues Paper at Chapter 4, [4.13].

The EA has nevertheless used a narrow market definition for the purposes of its market power analysis

3.5 Despite this, the EA appears to have adopted an arbitrarily narrow market definition for the purposes of its market power analysis on the basis that some substitute products are only just starting to be deployed in the New Zealand market:[4]

> *Because some of these substitute products (battery renting, demand response, and retail tariffs) are only just starting to be deployed in the New Zealand market, they may not yet be able to discipline the prices of shaped OTC hedge contracts (even if they will or may provide this competitive constraint in future)…*
>
> *So for the purposes of exploring this market power question, and consistent with our understanding of Commerce Commission practice to most clearly isolate and assess potential competition concerns, we have used a narrower (ie, conservative) potential market (baseload and shaped hedge contracts only)…*

3.6 We consider this approach is not appropriate for the purposes of assessing the potential existence of market power, for the reasons set out below.

4. Previous NZCC precedent

4.1 The New Zealand Commerce Commission (**NZCC**) has previously considered the relevant market in which suppliers of electricity operate. It follows that this precedent should be used as a starting point for any assessment of the relevant market. There would need to be a sufficiently sound basis to depart from existing NZCC precedent.

Contact Energy Limited and Natural Gas Corporation Holdings Limited

4.2 The NZCC has previously defined the relevant market as the national electricity generation and wholesaling market in *Contact Energy Limited and Natural Gas Corporation Holdings Limited*.[5] The NZCC noted, with reference to its previous decisions related to electricity trading, "this is the market in which the generators (sellers) and buyers of wholesale electricity interact to determine the prices and quantities traded".[6]

4.3 Specifically, the Commission noted that: [7]

> *…there is a close interrelationship between all types of contracts and spot sales – the underlying critical feature of all is the physical supply and demand of electricity…*
>
> *Accordingly the Commission considers that market power issues associated with generators and retailers and large users buying and selling electricity, whether through the spot market or through individually negotiated contracts, can be properly assessed within the national electricity generating and wholesaling market.*

[4] Issues Paper at Chapter 7, [4.5-4.6].
[5] *Contact Energy Limited and Natural Gas Corporation Holdings Limited*, 2003 Decision No. 491 at [48]. For further detail, see: https://comcom.govt.nz/__data/assets/pdf_file/0026/73466/491.pdf.
[6] *Contact Energy Limited and Natural Gas Corporation Holdings Limited*, 2003 Decision No. 491 at [38].
[7] *Contact Energy Limited and Natural Gas Corporation Holdings Limited*, 2003 Decision No. 491 at [45]-[46].

Mercury and Trustpower hedge

4.4 More recently, in its 2021 assessment of the 10-year wholesale electricity hedge between Mercury and Trustpower, the NZCC similarly defined the relevant market as the national market for the wholesale supply of electricity.[8]

Section 36 complaint

4.5 In July 2023, the NZCC responded to a section 36 complaint that the pricing behaviour of the four major vertically integrated electricity gentailers prevented independent retailers from effectively competing. The complaint alleged predatory pricing, and the NZCC also thought it appropriate to consider margin squeeze. The report from the NZCC case team found that, based on the evidence obtained, a breach of section 36 (or any other part of Part 2 of the Act) was unlikely.

4.6 While the NZCC case team did not appear to engage in any market definition analysis, it considered the relevant markets to be "upstream wholesale/input markets" and "downstream retail markets." Further, that the upstream input market includes "the (national) wholesale electricity market" and a "market for forward-looking electricity retail price risk management tools, e.g. OTCs, ASX futures and other bilateral agreements (together, the 'hedge market')."

4.7 While this is narrower than how the NZCC has previously defined the market (being the national wholesale electricity market encompassing all sales mechanisms), it is still broader than the market definition adopted by the EA. This suggests that the EA's approach to market definition is unduly narrow to assess market power issues.

The EA has departed from NZCC precedent

4.8 The EA has departed from the above NZCC precedent by defining a narrower market consisting baseload and shaped hedge contracts only.

4.9 As set out above, there would need to be a sufficiently sound basis to depart from existing NZCC precedent on the relevant market definition. In Bell Gully's view, and for the reasons set out below, the EA did not have a sound basis to depart from existing NZCC precedent in this case.

5. Overly narrow markets can falsely identify market power

5.1 In defining a narrow market, the EA notes that this is consistent with its understanding of NZCC practice to clearly isolate potential competition concerns. However, while this may be appropriate as an initial screen, it can lead to "false positives". The type of assessment being undertaken by the EA in this case requires a sufficiently precise market definition in order to ensure that the EA does not adopt an overly narrow market definition which overestimates the extent – and potential impact on competition – of any market power.

5.2 The NZCC sometimes uses a narrower, conservative market definition as an initial screen to isolate and assess potential competition concerns. In general, if a merger does not raise issues in a narrower market, it will not raise issues if the market is defined more broadly.

5.3 However, this is only a starting point. Where potential competition issues are identified in a narrow market, a decision-maker must undertake a more detailed assessment of the

[8] *Mercury NZ Limited and Trustpower Limited's retail business*, 2021 Decision No. 16 at [42]. For further detail, see: https://comcom.govt.nz/__data/assets/pdf_file/0036/267687/2021-NZCC-16-Mercury-and-Trustpower-Final-determination-27-September-2021.pdf.

boundaries of the relevant market (or any competitive constraints outside the market) before forming a conclusion based on that narrow market.[9]

5.4 Adopting a narrower market as an initial screen is not necessary in this case. The EA has conducted a detailed assessment of substitutable risk management products, which support a much broader view of the market than the one adopted.

6. New entry is relevant to market definition assessment

6.1 As set out above, there would need to be a sufficiently sound basis to depart from existing NZCC precedent on the relevant market definition. The EA appears to have justified adopting a narrow market definition on the basis that some substitute products (battery renting, demand response, and retail tariffs) are only just starting to be deployed in the New Zealand market and therefore may not yet be able to discipline the prices of shaped OTC hedge contracts. In Bell Gully's view, this is not a sound rationale to depart from existing NZCC precedent for the reasons set out below.

6.2 The electricity market is dynamic. Accordingly, new entry (in particular, batteries and demand response) is certainly relevant to determine the relevant market definition, particularly in the context of assessing the potential existence of market power. Price increases spur new entry in these types of products by both incumbents and non-incumbents, which is playing out in practice.[10] Accordingly, the EA's assertion that these products may not yet be able to discipline the prices of shaped OTC hedge contracts is, in Bell Gully's view, not well founded.

6.3 Indeed, the EA notes that these products are currently used as part of non-integrated retailers' risk management portfolios. Accordingly, these products cannot plausibly be excluded from the relevant market on the basis that they are nascent, because they can, and already do, constrain the prices of other risk management products.

6.4 Accordingly, even if it were appropriate to use a narrower market as an initial screen in this context, the market definition adopted by the EA does not accurately reflect the nature of competition in the supply of risk management products.

6.5 Furthermore, the NZCC's *Misuse of Market Power Guidelines* state that potential entry and expansion can be decisive in determining whether a firm has substantial market power.[11] Accordingly, the competitive pressure placed on existing firms by the vast amount of new entry in the newer types of risk management products (e.g., batteries and demand response) should indeed inform the EA's assessment.

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[9] For example, see: *Genesis Power Limited and Energy Online Limited*, 2002 Decision No. 476 at [19] where the NZCC recognised this approach, noting that where potential competition issues arise based on the narrower market, it is necessary to review the arguments and evidence in relation to broader markets. For further detail see: https://comcom.govt.nz/__data/assets/pdf_file/0014/73400/476.pdf.

[10] For example, in October 2023 Waikato Electricity Lines (WEL) commissioned New Zealand's first grid scale battery. Recently Ethical Power and Kea-X have secured consents for a grid scale battery in Christchurch. Incumbents are building out battery capacity too, with Meridian's Ruakākā 100MW grid scale battery due to enter the market by the end of this year, Contact recently committed to build a battery that is expected to be operational by March 2026, and is considering a second battery at Stratford. Genesis also recently announced a final investment decision to build a 100MW battery at Huntly, with plans for up to 400MW of batteries.
In relation to demand response (as recognised in the Issues Paper), Octopus Energy launched its Saving Sessions demand response offer in May 2024 and at the same time announced its hot water cylinder demand response would be available to all customers with eligible meters. Additionally, Contact Energy launched its Hot Water Sorter roll-out in April 2024.

[11] For further detail, see: https://comcom.govt.nz/__data/assets/pdf_file/0014/311360/Misuse-of-Market-Power-Guidelines-March-2023.pdf at [50].

7. Submission on appropriate market definition

7.1 Based on work undertaken with Contact, we consider the appropriate market definition remains the national, wholesale electricity market (consistent with NZCC precedent).

7.2 Electricity market participants trade electricity through a variety of contractual mechanisms. While electricity is traded based on spot prices, with prices determined on a half-hourly basis, market participants also trade futures on the ASX market and enter into agreements directly with each other (OTC contracts) to hedge their exposure to spot prices. However, these contractual mechanisms do not constitute separate markets. As the NZCC has previously recognised, there is a "close interrelationship between all types of contracts and spot sales – the underlying critical feature of all is the physical supply and demand of electricity."[12]

7.3 Ultimately, futures contracts and OTC contracts are all based around an expectation of what the spot price will do at a given point in time. In this way, they are inextricably linked. Equally, while OTC contracts can have more flexible features than a futures contract traded on the ASX, prices of these instruments will move up and down in unison. Again, this is because they are ultimately both linked to the spot price and there is both demand-side and supply-side substitutability between these products. Similarly, gentailers readily switch between supplying risk management contracts to different wholesale customers - including C&I customers and retailers, with such sales effectively seen as interchangeable.

7.4 Buyers of wholesale electricity can also react to changes in the spot price. Electricity retailers and large C&I customers can effectively act as energy 'suppliers' (particularly at peak times) via demand response, which provides electricity generators the ability to scale down production in times of peak demand or supply shortages.[13] This is one way that gentailers manage supply risk.

7.5 Accordingly, while there is a range of different contractual mechanisms, these are all closely interrelated, and are substitutable (i.e., hedge contracts are substitutable for spot trading, customer load shifting and building new generation), so do not constitute separate markets. Accordingly, the national wholesale electricity market definition remains appropriate.

8. Collective references to "gentailers having market power"

8.1 As a separate issue, we consider the EA incorrectly focusses on market power of "the gentailers" as a collective, rather than recognising these are separate (and vigorous) competitors. While the EA has correctly distinguished between unilateral market power and coordinated market power, the starting point should be to ask whether an individual competitor has market power, rather than starting the analysis as though gentailers are part of a conglomerate with the potential to exercise market power as one.

8.2 For example, in the context risk management of intraday shape, the EA notes that "gentailers are currently the primary ***supplier*** of this type of risk management option *[emphasis added]*", and "for this primary supplier role to translate into gentailers having substantial market power in any relevant risk management market, we consider that the following would have to hold…"[14]

8.3 While it is true that more than one firm may have a substantial degree of market power in a market, the EA's analysis should focus purely on the extent to which any individual gentailer

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[12] *Contact Energy Limited and Natural Gas Corporation Holdings Limited*, 2003 Decision No. 491 at [45].
[13] For example, Contact will provide 30MW of renewable generated electricity to NZ Steel for its new $300m Electric Arc Furnace in a flexible off-peak arrangement that will enable the industry leader to scale down production in times of peak demand or supply shortages. For more information, see: https://contact.co.nz/aboutus/media-centre/2023/05/18/contact-announces-pioneering-renewable-energy-agreement-with-nz-steel.
[14] Issues Paper at Chapter 7, [3.4].

may have substantial market power. Competition between gentailers in relation to the supply of risk management products is strong, with each gentailer exerting a constraint on the other. Additionally, each gentailer has a vastly different position as to the extent to which they can provide different risk management products.

8.4 Indeed, the EA in the Issues Paper effectively dismisses the prospect of collective market power in this context, noting that it has "seen no evidence of the exercise of coordinated market power."[15] Accordingly, it is not appropriate to group the gentailers together when referring to the existence of market power.

9. Implications of market definition adopted by the EA

9.1 If the EA adopts an unduly narrow market definition and gives insufficient weight to competition between gentailers within this market, it risks reaching inaccurate conclusions about the existence of market power. Any recommendations arising from such conclusions would be misplaced.

9.2 Even if it were determined that one or more gentailers did have market power today (which appears not to be the case when market definition is properly assessed), the best outcome for competition would be for this market power to be eroded through new entry and expansion. The Issues Paper discusses a range of examples of new entry and expansion in the market which will increase the options available to independent retailers for shaped load. Endeavouring to base policy decisions on an unduly narrow market, taking a snapshot in time rather than allowing the market to play out, could lead to unintended consequences.

Bell Gully

[15] Issues Paper at Chapter 7, [5.12(a)].

Responding to matters set out in Reviewing risk management options for electricity retailers – issues paper

Toby Stevenson, Dr Stephen Batstone, Kieran Murray

20 December 2024

Contents

1 Executive summary

The Authority's **Reviewing risk management options for electricity retailers – issues paper** reports that to date retailers have been able to secure substantial shaped hedge cover through OTC contracts, but the market for shaped cover is neither deep nor liquid. Over a third of the time retailers only receive one offer to requests for shaped hedges.

The Authority notes the evidence points to fuel or capacity scarcity often being the driver behind the current thin and illiquid market for shaped hedge cover. While the evidence points to scarcity, the Authority seeks to understand why some gentailers elected not to respond to some requests for proposals for shaped hedges, or why gentailers sometimes provided non-conforming responses.

The Authority decided it should do something because:

> while the evidence does point to scarcity being a driver, there is also a plausible driver that has competition implications, e.g., refusing to supply products on appropriate terms to counterparties who are downstream competitors, indicating that some level of market power could have been in play.

The Authority's analysis of the cost of OTC super-peak hedges indicates the prices for OTC baseload and peak hedge contracts are likely to be competitive. However, it was not able to determine whether the prices of OTC super-peak hedges were consistent with competitive prices, and whether the increase in OTC super-peak prices (as a percentage of ASX baseload prices) observed over the assessment period is justified.

The Authority recognises that OTC super-peak hedge contract prices will trade at a *substantial unquantified premium over ASX baseload prices adjusted for shape*. However, the Authority was not able to determine the efficient level of such a premium, explaining (in Appendix A of its report) that its estimates suffer from:

- likely underestimating the shape premia
- likely underestimating the illiquidity premium
- not estimating a spot price volatility premium
- adopting a scarcity premium that underestimates contract prices
- not adding a premium for ASX volatility.

Absent accurate estimates of these premia, commentary as to whether observed prices or terms for super-peak hedge contracts are impacted by market power becomes speculative. Revealed prices, for example, may have reflected the real-world considerations faced by sellers who underpin flexible contracts:

- with existing gas plant pricing in the uncertainty of whether they would have insufficient fuel
- with existing hydro plant pricing in the uncertainty of whether they would have sufficient inflows at all points during the contract term, and the uncertainty of whether gas-fuelled hydro firming would come online in this scenario due to the gas situation (i.e., August this year)

- by investing in peaking plant pricing in the uncertainty that their investment would be undermined by Tiwai exit or the Onslow proposed scheme.

The conceptual difficulty is that efficient economic costs of these premia cannot be accurately calculated because economic costs and prices are jointly and simultaneously discovered via the competitive process.

The practical difficulty is that the liquidity of flexibility products is limited by flexible generation capacity and the security of its fuel supply. In the New Zealand electricity sector, flexibility contracts cannot be physically backed by a number of prevalent fuels (e.g., geothermal, wind);. Until now, super-peak contracts have only been able to be backed by gas and hydro – two fuels which, in the New Zealand context, are quite uncertain on a medium-term basis.

The 'elephant in the room', is that growth in peak demand has exceeded growth in any type of firm capacity for nearly a decade. This lack of investment must be a central feature in any analysis of flexibility contracts struck prior to now.

If peak prices in the spot market are insufficient over time to attract and maintain peak capacity, the Authority can be confident that market power could not have been in play. Market power allows an entity to obtain an 'economic rent'; that is, an amount that exceeds the amount needed to maintain the resource. Peak demand rising faster than peak capacity supports a presumption of *under pricing* of super peak contracts and spot prices, at least at the margin which is what matters for an efficient market. If the revenue earnt by an existing supplier is less than that required by an efficient new entrant, the supplier cannot be said to have exercised market power in a manner adverse to the long-term benefit to consumers.

It is of course an unpalatable message, after the events of this year, that peak prices may have been too low in recent years to ensure supply will match demand in every half hour. But it is critical for the long-term benefit for consumers that the Authority retains a clear line of sight between demand and supply and pricing.

The forthcoming investment in industrial demand flexibility and batteries is encouraging. Our analysis suggests that some of substantial risks (notably policy and regulatory uncertainty) associated with firm capacity investment have reduced, and investment is coming to market in forms of demand response and battery storage that could plausibly back the standardised super peak contract. Liquidity in flexibility contracts like super-peak contracts should improve as these investments materialise. A caution is that the announced additional sources of flexibility – other than Meridian and Contact's 2024 demand response deal with Tiwai - are only coming to market over the next 2 years.

An intervention into the pricing of super peak contracts, when the problem is insufficient supply of flexible generation and demand, can only harm consumers, potentially severally. Recent history of the New Zealand electricity sector has shown that poorly conceived regulatory and policy interventions can undermine investment to the detriment of consumers.

2 Is there scarcity of super peak electricity supply, and, if so, why has it occurred?

2.1 Is there scarcity of peak electricity supply?

The issues paper leads with the following introduction:

> The Electricity Authority commenced a risk management review in December 2023 to test whether the availability of over the counter (OTC) risk management contracts, in the context of other risk management options, is creating a barrier to entry to expansion in the retail electricity market and therefore harming (retail) competition.

A prerequisite for the availability of a peak-related contract is the availability of flexibility capacity (including demand reduction). Any peak-related contractual obligations that can't be met physically ultimately result in the supplier being exposed to wholesale market prices for any shortfall. Hence, when pricing the contract, the supplier will – necessarily – need to consider the potential exposure to the spot price, caused by the contract, under a range of future scenarios over the contract duration. This, in turn, must consider the potential scarcity in firm capacity across the whole market. The number of providers of super peak products is limited to three gentailers.[1]

Below we consider how firm capacity 'sufficiency' has evolved, and how market prices have responded.

A change in peak demand growth

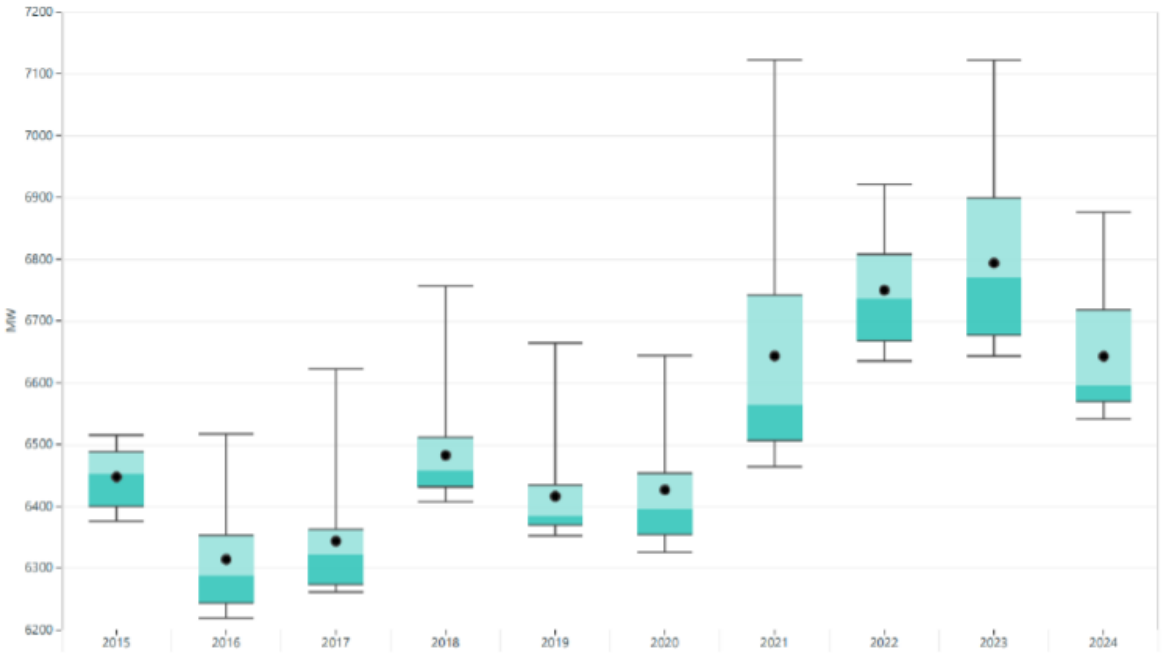
Little to no growth in peak demand in New Zealand between 2006 and 2015 meant that questions as to whether the electricity market would provide commercial incentives to maintain capacity to meet peak demand, remained unaddressed until very recently.[2]

In Figure 1**Error! Reference source not found.** Transpower provides an assessment of peak demand growth over the past 9 years. It notes the last four years. The reduced peak demand over winter 2024 was largely due to reduced industrial load resulting from higher spot market prices and warmer temperatures. This included up to ~205 MW of Tiwai aluminium smelter demand reduction through its contractual arrangements with Meridian Energy and Contact Energy.

Figure 1 Top 20 daily load peaks in each year since 2015[3]

[2] For example, the Authority's "Enduring an Orderly Thermal Transition" consultation paper; 13 June 2023, which reported an analysis of the cashflows associated with firm generation (CCGT, OCGT and Rankines) in 2025 and 2032. The 2025 analysis was based on a simulated set of market prices, and was not compared to actual spot market prices. It also contained a set of assumptions about gas that are quite benign compared to the situation we find ourselves in today.

[3] Transpower Security of Supply Review - Winter 2024 November 2024

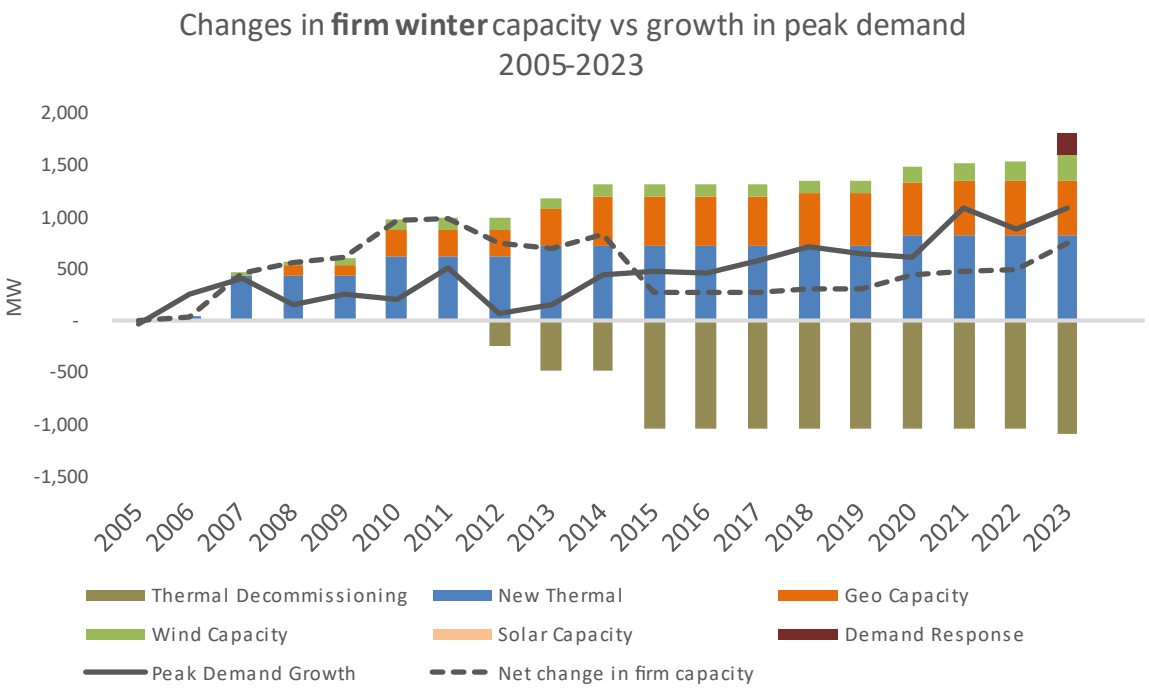


Did firm capacity keep pace with peak demand growth?

Figure 2**Error! Reference source not found.** reproduces a chart that illustrates the changes in firm winter capacity compared to the growth in peak demand over the period 2005 - 2023.

While there was a significant net reduction in firm capacity in 2015, and only modest growth in firm capacity in the last few years, peak electricity demand resumed growing around 2013. As a result, growth in peak electricity demand consistently exceeded growth in firm capacity since 2015. Indeed, firm capacity barely grew for a period of 4 years following the decommissioning of Otahuhu and Southdown.

Figure 2 Changes in firm winter capacity vs growth in peak demand 2005-2023. Source: Whiteboard Energy Ltd



Source: Analysis provided by Whiteboard Energy

The chart uses similar assumptions to the Authority's Security Standards Assumptions Document (SSAD), in particular that 25 per cent of wind generation (300MW) is deemed likely to be available at the peak. Whiteboard's assessment makes Huntly unit five available but only two Rankine units, whereas the SSAD derates all thermal by an average outage factor. The assessments do not allow for any derating of thermal generation due to gas supply shortages, but the third Rankine unit can offset some of this.

Although firm capacity has grown over the period since 2015, the balance of firm capacity to peak demand only improved in 2023 with the Authority's difference rule. This rule requires non-contracted water heating control to be offered in as difference bids, at a market price of $9,000/MWh. The rule means hot water control is available to offset the risk of an outage, but the capacity in the market to meet demand before prices reach (close to) scarcity prices, and therefore to mitigate financial risk, was reduced. The improvement in 2024 was due to the demand response arrangements in the New Zealand Aluminium Smelter (Tiwai) agreements. According to Whiteboard's analysis, despite some increase in firm capacity, the cumulative shortfall of firm capacity from 2005 to 2023 is around 400MW.

As we look forward, the next 2-3 years see new firm capacity coming to market. A number of grid-scale batteries will be commissioned by Contact, Meridian and Genesis. On the demand response front, a 'super peak' demand response deal between Contact and NZ Steel will come into effect as of December 2025. A number of retailers are developing the capability to manage hot water and electric

vehicle charging[4] in a way that reduces peak demand. Baseload geothermal investments by Contact at Tauhara and Te Huka will add to firm capacity, although this will eventually be offset by the eventual decommissioning of Taranaki Combined Cycle[5]. Notwithstanding that, the last 5-7 years has seen very little incentive to invest in firm capacity, and the pricing of historical super-peak contracts must be viewed through that lens.

Did the System Operator indicate concerns about future firm capacity?

Transpower, as the System Operator, is responsible for publishing the medium-term security of supply assessment (SOSA) annually. This assessment uses forecasts of electricity supply and demand to assess the ability of the electricity system to meet New Zealand's needs over the decade ahead. Transpower reports on the prospects for a winter energy margin and a North Island winter capacity margin. From 2018 on some scenarios were showing that the winter capacity margin was vulnerable to increasing peak demand because of electrification and the possibility of peaking capacity not keeping up with peak demand growth. More detail is provided in Appendix A.

How is this scarcity reflected in electricity spot and futures prices?

Wholesale spot market prices are the primary indicator of scarcity in fuel. Figure 3 plots daily average spot prices and average OTA futures settlement prices.

While spot prices are reflecting 'real time' scarcity, there are a number of ways in which concerns about future fuel supply will influence wholesale market conditions. The primary one is through opportunity cost – when fuel is limited (gas, hydro, coal), a plant owner's offer of that fuel to the market will reflect an inter-temporal tradeoff: do I use the fuel today, or do I hold it for the future?

Futures prices are a more complete picture of expectations of future conditions, and will include expectations of supply, demand, outages and the impacts of government policy. However, most liquid electricity futures contracts are baseload products i.e., for the average price over a calendar quarter. While the spot prices and electricity futures prices are linked, they are not driven by the same factors, and futures impute risk and uncertainty about future matters to a greater degree than the spot market. However, it is useful to consider what they are both telling us simultaneously.

The timing of the past three generation elections is marked on the chart. Since 2021, the average price of electricity futures for the back three years has been increasing which suggests there were other factors (which we explain further below) that limited investor's appetite to invest. Prices also reflect seasonal hydrology. What we can't see from the chart is when or whether fuel scarcity became a critical issue for the market. That question is central to the hypothesis in the issues paper.

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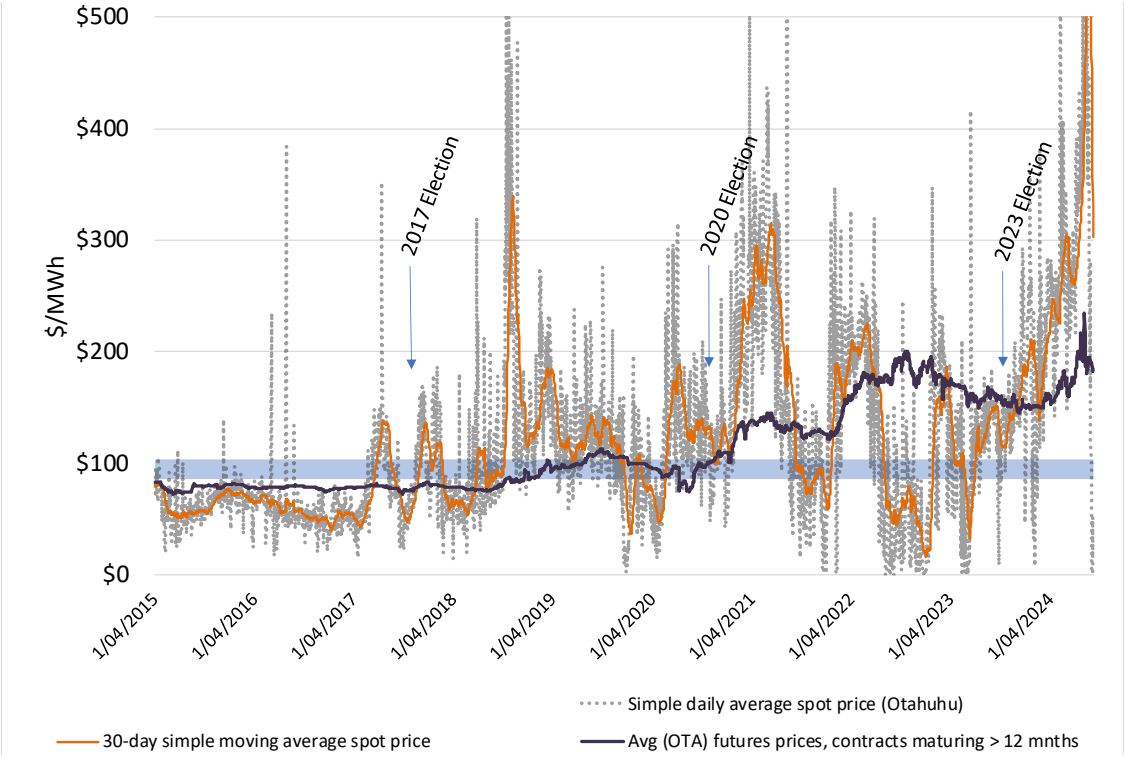
[4] The capability to 'manage' hot water and EV charging we reference here is the ability for a retailer or flexibility aggregator to dynamically shift a customer's demand at their election. We note that a number of retailers have deployed time-of-use retail tariffs that incentivise non-peak EV charging (and other shiftable consumption) over the last 2-3 years, which will achieve a similar effect, but at the customer's election.

[5] Contact media release "Contact Energy (Contact) will keep its Taranaki Combined Cycle (TCC) 330MW thermal plant available over CY2025." Operation in CY2025 remains subject to a number of conditions notably "At this time, Contact does not intend to contract gas for the plant unless market participants express a demand for it, linked to a gas purchase arrangement". November 2024

Figure 3 Spot and forward prices 2015 - 2024



It is clear that both spot and futures markets were signalling an unprecedented level of scarcity over the period 2019-2024.

We now unpack our analysis of the drivers behind this.

2.1.1 Why has the scarcity occurred?

In short, the reasons why this situation has emerged is a combination of:

- production of an important fuel used to underpin the contracts, gas, faced issues as early as 2018, and has declined markedly since 2021, and
- investment signals for building and maintaining peaking plant have been weak as a result of climate policy, energy policy and significant demand uncertainty in the case of the Tiwai aluminium smelter.
- Peak demand has grown.

The Authority has acknowledged a limited set of concerns to firm capacity. The Authority released a paper documenting potential solutions for peak electricity capacity issues earlier in 2024. There is no problem definition as such but it does say: [6]

[6] Electricity Authority Potential solutions for peak electricity capacity issues Consultation paper 12 January 2024

> The management of capacity margins has not been the focus of the power industry historically as, until recent years, there was little growth in peak demand or energy consumption. This provided no signal that investment in new generation was needed.
>
> The recent drive for electrification of the economy has seen a sharp increase in peak demand over the last two years. This, coupled with thermal fuel supply issues and the displacement of thermal base-load generation, has led to resource coordination issues when managing peak demand periods. **In simple terms, there is not enough capacity available to be delivered to ensure electricity supply meets demand**.

As we outline in the following sections, we do not agree that the situation only emerged over "the last two years".

2.1.2 The removal of RCPD and its effect on peak demand growth

Changes to the Transmission Pricing Methodology (introduced 2022) included removing regional peak coincident demand (RCPD) charges. Previously EDBs and industrial users faced a commercial incentive to deploy demand response during periods when the regional peak was nearing its maximum. With the removal of this incentive the possibility arose that EDBs and industrials would cease to deploy this demand response, leading to an increase in peak demand.

The issues paper makes no mention of the removal of RCPD. This had been the subject of an earlier standalone study which observed: [7]

> We found evidence that some large industrials have changed their electricity consumption over peak periods—they previously decreased or shifted consumption in peak periods to reduce their RCPD charge—but did not appear to do this in 2022. We estimate that removing the RCPD charge increased daily peak consumption by around 150MW during the top 300 consumption periods in 2022. This is much larger than the underlying growth in peak consumption, but relatively small in the context of the New Zealand electricity market.

This seems conspicuous by its absence from a discussion about whether scarcity (peak capacity less peak demand) has an impact on the supply of flexibility products. Whatever the expectations were and whatever the reduction in contribution to meeting peak demand, this regulatory measure has contributed to the pressure on the physical capacity and fuel scarcity problem during periods of peak demand.

2.1.3 Gas – what did we know and when did we know it?

In the middle of 2018 the Minister of Energy wrote to the GIC following a meeting with Andrew Knight the GIC Chief Executive. The Minister raised the issue of information disclosure requirements for market participants where information could have an impact on the downstream gas market:[8]

[7] Electricity Authority The impact of the RCPD charge removal on peak demand 9 Mar 2023
[8] Hon Megan Woods letter to Andrew Knight Chief Executive Gas Industry Company 25 Jul 2018

> I am concerned, in light of the recent outage at Pohokura, the requirements may be insufficient and that if information is not required to be disclosed in a timely manner it may have a material impact on the wider market for gas.

The GIC replied [9]

> If we conclude that existing information disclosure is not sufficient we think part 4A of the Gas Act should be amended to clearly provide for the regulation making powers contemplated in your letter.
>
> Gas Industry Co intends to create an information disclosure workstream to progress this issue.

The resulting changes to information disclosure focused on unplanned outage or planned outage at a gas production facility or a gas storage facility for all gas and related market participants but not on the prospects for future production.[10]

The issue of the prospects for future gas production was, however, the subject of many presentations and papers from then through to the present day.

For example GIC told the SRC in 2019:[11]

1. Parallel to the work on the unplanned outage or planned outage disclosure process, upstream parties and Flex Gas (First Gas) are working together to develop a voluntary, industry-led disclosure regime for production and storage outage information. This information was identified as the largest information gap in the industry.

2. We set up an industry notifications webpage on our website and the industry is taking the opportunity to post notifications. As an example, notifications on reduced production from the Kupe Production Station were posted by Beach Energy who have been regularly updating the industry on the status of the repairs.

3. GIC is working with the EA on thermal (gas and coal) fuels disclosure in the electricity sector.

4. GIC has held some initial discussions with MBIE around the frequency and availability of information on gas production forecasts and storage in Ahuroa.

In 2020, the GIC prepared a Briefing to the Incoming Minister. GIC told the Minister:[12]

> Long term gas supply and demand scenarios commissioned by Gas Industry Company identify that natural gas supply conditions are likely to tighten over the next several years. New Zealand has around 2000 petajoules of reserves currently booked, however those reserves will only be available to meet demand requirements if industry invests in development of existing production.

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[9] GIC Chief executive to Hon Dr Megan Woods Minister of Energy Resources
[10] Gas (Facilities Outage Information Disclosure) Rules 2022.
[11] GIC Andrew Knight - Chief Executive and Paul Cruse - Senior Adviser Update on Information Disclosure to the Security and Reliability Council 24 October 2019
[12] Gas Industry Company Briefing to Incoming Minister of Energy and Resources October 2020

> Gas Industry Company estimates that **industry will need to invest around $300-500 million every 3 to 5 years to produce existing reserves** and maintain production levels. Current gas and oil prices are at a level that incentivises the required investment. **Without ongoing investment in development, currently expected gas reserves will not be available for expected demand.**
>
> During the transition to 100% renewable electricity, some customers currently utilising gas for fuel will exit.
>
> After gas exits baseload generation, some gas will continue to be used to provide flexibility for renewable generation.
>
> Today, when renewables availability is insufficient to supply electricity demand, flexibility is provided by reducing gas demand from petrochemical manufacturers (and by releasing stored gas from the Ahuroa storage facility). Thus, gas used in peaking generation (when renewables availability is insufficient) is met mainly from demand side, not by 'turning on' extra gas supply.
>
> In a 100% renewable electricity system, gas can be available as the most cost-effective and efficient energy source to provide flexible security of supply in dry years. This is because gas can be brought to market quickly at a competitive lower cost than alternatives (such as renewables overbuild). For gas to provide that flexible energy security, new contracting arrangements are needed to ensure that gas is available when needed.

It was around this time that an early physical manifestation of constrained gas production and gas supply impacting on electricity generation emerged. The canary in the mine might have been a 20 December 2020 media release from Contact Energy to the stock exchange:[13]

> OMV advises Contact of reduced gas supply estimate for 2021
>
> Gas producer OMV New Zealand ('OMV') has revised down its estimates of the gas available to Contact Energy ('Contact') from the Maui and Pohokura fields in the 2021 calendar year by 3.7 petajoules (PJ) to 10.6 petajoules.

In isolation this might have been missed or treated as a one off situation but we now know this was the beginning of gas producers recalibrating their supply arrangements to meet declining volumes.

The SRC Forward work programme in 2021 ranked reliability and resilience of the gas industry (with implications for electricity generation capacity and energy security) as its third highest risk, based on a June 2019 report from the gas industry.[14]

In 2021 many commentators including electricity generators Meridian, Contact and Mercury were warning the Authority that the government's interventions were damaging the gas market with severe

[13] Contact Energy NZX Announcement OMV advises Contact of reduced gas supply estimate for 2021 02 December 2020

[14] Security and Reliability Council FORWARD WORK PROGRAMME Meeting Date: 25 February 2021

implications for security of supply in electricity. That year the GIC reported on its Gas Market Settings investigation: [15]

> We have assumed that natural gas will not be used as fuel for electricity generation beyond 2030 (which is a different approach than most modelled scenarios), but that it will be needed for some petrochemical, industrial, commercial, agricultural and residential use for longer.
>
> Despite the outlook showing there are sufficient reserves in the ground to meet New Zealand's gas demand, without ongoing **investment well in advance of when the gas is needed**, there is a real risk that not enough gas will be able to be delivered to major gas users, including electricity generators, during the transition out to 2030 and beyond.

At the SRC's meeting on 21 October 2021, an updated gas reliability and resilience paper was provided and presentations were made by the joint authors Enerlytica, The Gas Industry Co (GIC), OMV, Todd and First Gas.

Enerlytica observed:[16]

> **No free lunch** –Capex of $2-3 bln required during the 2020s alone to maintain continuity. Policy direction since 2018 has made winning this capital from international investors now far more challenging. It is the retention of Methanex that will continue to underwrite the flow of this investment, with other users including powergen as beneficiaries.

The GIC observed:[17]

> "Without ongoing investment (well in advance of when the gas is needed), there is a real risk that not enough gas will be able to be delivered to major gas users, including electricity generators, during the transition out to 2030 and beyond."

On 8 May 2024, the day prior to Transpower requesting consumers reduce electricity demand, the Gas Industry Company released figures showing a 12.5 per cent reduction in gas production during 2023, and a 27.8 per cent reduction in gas production in the first three months of this year beyond what was projected. The Gas Industry Company's advice to large gas consumers was to expect gas supplies to be constrained throughout the decade. Some industrial consumers may not be able to secure expected gas volume and prices are likely to be significantly higher.[18]

Following the events of winter 2024 Transpower reports: [19]

> Peak capacity risks are ever-present and will persist until there is sufficient investment in flexible resources such as batteries, demand response and peaking generation.
>
> Growth in peak demand and increasing intermittent renewable generation makes balancing supply and demand more challenging and increases reliance on slow-start thermal generation to provide flexible resources into the market. Over 90% of the

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[15] Gas Industry Company Gas Market Settings Investigation - Report to the Minister of Energy & Resource 30 September 2021
[16] Security and Reliability Council Gas Reliability and Resilience meeting date 21 October 2021
[17] ibid
[18] GIC reference Quarterly Update: April 2024
[19] Transpower Security of Supply Review - Winter 2024 November 2024

> unconsented generation pipeline is made up of intermittent generation sources that will exacerbate this challenge. This highlights the need for investment in new flexible peaking capacity batteries, demand response and enabling market settings.
>
> To manage capacity risks and reduce their impact on consumers supply, a well-informed and coordinated industry response is needed to offer more resources into the market to balance supply and demand while maintaining system security

2.1.4 Electrification and reducing fossil fuel contribution to security

During the period 2018 – 2023 the Minister pushed a commitment to achieve 100% renewable electricity by 2030 but it never became policy. It was an aspirational goal in the Green party's 2017 coalition agreement and became a policy goal in the Labour Party's 2020 campaign but never became binding in the sense of a government policy statement or any equivalent mandate to the sector.

The 2017 coalition agreement between Labour Party and the Green Party[20] signalled the government would proceed to introduce a zero carbon 2050 Act and establish a Climate Change Commission (CCC). Both the interim and fully established CCC disputed the economic validity of the 100% renewable goal – let alone its achievability by 2030 – but themselves proposed actions that would limit the uptake of natural gas.

Notwithstanding that, the Government remained resolute in its commitment to 100% renewable electricity by 2030. The Minister's repeated references to this goal impaired investment signals for the gas market, and fossil fuel baseload and peaking capacity.

2.1.5 Onslow and the NZ Battery Project

The centrepiece of the commitment to 100% renewable electricity was the NZ Battery Project, and the potential answer it provided to the main criticism of 100% renewable electricity: the dry year problem. The NZ Battery project was announced following a discussion about the potential for a pumped hydro storage scheme contributing to a low carbon electricity system in the ICCC report:

> The NZ Battery Project was established in late 2020 to find innovative solutions to the 'dry year problem', when hydro-electricity lakes run low, leading to the burning of more fossil fuels to cover the electricity shortfall.

One key project considered was pumped hydro storage scheme at Lake Onslow in Central Otago. While the governance and operational models of the lake Onslow Scheme were never confirmed the widespread assumption – confirmed in later documents released - was that it would be allowed to act in market including providing peaking capacity.

The prospect that the Government would support the entry of a 1,200MW peaker into the electricity market can only have further undermined the signal for private sector investment in peaking capacity, especially as the government maintained its position that Onslow could be in place by 2030. Only

[20] New Zealand Labour Party & Green Party of Aotearoa New Zealand Confidence and Supply agreement (See here) October 2017

when the business case for Onslow was released in 2023 did it become apparent that construction completion would not be completed prior to 2037.

In December 2023 the incoming government axed the $16 billion pumped hydro scheme at Lake Onslow, removing a significant uncertainty.

2.1.6 Tiwai exit uncertainty

As the Authority writes, the uncertainty around whether the smelter would close has not been helpful. It was especially unhelpful that Rio Tinto made the announcement to close the smelter in 2020 then in 2021 announced it would keep the to the end of 2024.

On 31 May 2024 Meridian Energy and New Zealand Aluminium Smelters (NZAS) announced they, along with Contract and Mercury, had agreed a long-term fixed price power contract until 2044. The new agreement contained provisions for the smelter to cut power usage at times when there was peak demand but insufficient supply in the country.[21]

If the smelter had closed there would have been a 12% reduction in energy demand in every period of the year. The pressure on peak capacity would have eased. The uncertainty associated with whether the smelter would close therefore would have had a very large impact on confidence to invest. The news that it will stay open for 20 years adds to the pressure on energy supply and peak capacity, noting the presence of the demand response agreements.

2.1.7 Ukraine and international fuel prices

As cited by the Authority, Russia's invasion of the Ukraine has significant impacts on global fuel prices. The direct effect on New Zealand was through the price of Indonesian coal, ordered by Genesis. Figure 4 shows the significant escalation in coal prices 2022/23. The increased price of coal had a direct effect on Huntly's SRMC, and a very plausible impact on water values (which contain signals about the expected market price in the event that Huntly is required to firm hydro). Further, in the early months of the war, it added significant uncertainty in futures markets about the future price of electricity, as traders weighted different scenarios relating to the need for coal. There was no credible information globally about how long the war would last, and what the medium-term impact on coal price would be. Studies are beginning to emerge in the academic literature about the far-reaching impact of the war on distant wholesale electricity spot and futures contracts, with many generalising these to include demand, supply and policy uncertainty (see e.g., Kaur et al, (2024)[22]).

[21] RNZ "Tiwai Point aluminium smelter to stay open until 2044" See here 31 May 2024

[22] Kaur, C., Siddiki, J., & Singh, P. (2024). The asymmetric impact of input prices, the Russia-Ukraine war and domestic policy changes on wholesale electricity prices in India: A quantile autoregressive distributed lag analysis. *Energy Economics*, *132*, 107428. https://doi.org/10.1016/j.eneco.2024.107428

Figure 4 - International price of coal, 2010 – 2023, USD.

2.1.8 Lithium prices – high prices delayed BESS investments….

The COVID-19 pandemic caused significant disruptions to global supply chains for lithium-ion batteries, leading to increased prices and constrained supply worldwide. In 2020, China was the largest manufacturer of lithium-ion batteries and accounted for 73% of annual production.[23] China's central role in battery manufacturing and distribution caused global repercussions when the country faced national shutdowns during the initial months of the pandemic, as quarantine measures caused production lead times to more than double for most goods. These challenges were exacerbated by labour shortages and border restrictions, which impacted distribution networks and intensified supply shortages. Lithium prices increased by 830% in the Chinese spot market from December 2020 to April 2022, ultimately slumping growth for renewable energy technologies and delaying investment in many global economies.[24]

While lithium-ion battery prices have been volatile in recent years, prices have trended downwards since the pandemic. International evidence shows that lithium spot prices declined more than 80% from December 2022 to January 2024.[25] As a critical component in battery production, the decline in

[23] Dyatkin, B., & Meng, Y. S. (2020). COVID-19 disrupts battery materials and manufacture supply chains, but outlook remains strong. MRS bulletin, 45(9), 700–702. https://doi.org/10.1557/mrs.2020.239

[24] Sun, X., Ouyang, M., & Hao, H. (2022). Surging lithium price will not impede the electric vehicle boom. *Joule*, *6*(8), 1738-1742.

[25] Bradley (2024). Lithium Prices in Free Fall: Implications for Clean Energy Transition in the Private Sector. https://www.bradley.com/insights/publications/2024/02/lithium-prices-in-free-fall-implications-for-clean-energy-transition-in-the-private-sector

lithium prices has increased investment in battery energy storage systems (BESS). The International Energy Agency reported that battery storage was the fastest growing technology in 2023, with global deployment more than doubling from the previous year.

These trends impacted investment in New Zealand. As outlined earlier, within the last 2 years, a number of gentailers have announced investments in grid-scale batteries. These will be commissioned over the next 2-3 years. However, as technology-takers, we expect the dynamics in lithium and battery markets have impacted the pace at which these gentailers have been able to bring these investments to the electricity market,

3 Part 2: Is pricing of OTC super peak contracts as expected in a competitive market?

3.1.1 How to price a peak or super peak product

The approach the Authority has taken to pricing peak products is theoretical but even so they haven't been able to estimate values for the premia of peak prices over baseload electricity futures. This section steps through the process of pricing a peak or super peak product. It is a generic description but reflects the reality facing traders. The perspective taken is that of a gentailer, as these are the participants who have priced super-peak products assessed by the Authority.

Each portfolio will have a unique combination of fuel sources for its electricity generation and each of those comes with its unique variability.

Each gentailer will have a book of physical (e.g., retail demand) and financial contracts that, once balanced with its ability to generate, creates a net 'exposure' to the wholesale market. That book will be made up of some retail load, some commercial load and some industrial load and, in each case, there will be a mix of terms and conditions priced to reflect the risk taken by either seller or buyer. Notably, some contracts such as residential contracts will be a fixed price for a variable volume of offtake so the volume risk remains with the seller, and some will be financial products such as contracts for differences (CFDs) where the volume risk is taken by the buyer.

Looking forward (e.g., over the period of a flexibility contract being priced), each of these components are uncertain; hence, the degree of financial exposure to the spot market is uncertain. Like any market participant, a gentailer must manage this risk in order to remain within the organisation's risk appetite. Gentailers have very large capital exposures which must be managed prudently.

When a buyer such as an independent retailer seeks a peak or super peak product, a gentailer who offers product has to account for:

- its ability to generate at peak times to meet contractual obligations
- the risk that fuel or capacity is not available in a future winter peak when the product is in force
- its ability to secure the electricity futures volume required to cover its risk using baseload electricity futures
- future shape risk between the hours the contract is effective and the cover from the electricity futures contract
- the exposure for off peak cover acquired using baseload futures as a hedge for the peak of super peak contract
- the opportunity cost of adding baseload electricity futures for this purpose and not for the balance of the book
- location risk
- any additional margin required to adequately account for the cumulative risk.

These factors reinforce that pricing hedge contracts is fundamentally a forward-looking analysis, and hence involves the pricing of risk.

Premia

It is well established in the economic literature that risk manifests in price by way of risk premia.

The Authority writes:

> "Offer prices for super-peak contracts could be consistent with a lack of competition, or simply reflect scarcity. Reasons for this uncertainty include:
>
> (a) There have been some accepted prices that were substantially higher than ASX prices (plus shape premium). This could be because the contract was competitively priced, or because the buyer had no other viable alternative.
>
> (b) Our risk premia are based on historical data, but these should ideally be forward-looking. There is also uncertainty around how risk premia will change in the future.
>
> (c) We have been unable to estimate other premia (e.g., premia for scarcity, volatility, and illiquidity) that could have a big impact on super-peak contract prices (and are likely increasing)".

The issues paper quotes the Australian Energy Market Commission's (AEMC) description of risk premia. However, this description focuses on the premia one might pay for a baseload contract over forecast spot prices. It doesn't address the premia of peak and super peak products over a base load contract.

The issues paper focuses on the relativity of peak and super peak prices to base load hedges and in each case (except location premium) it notes it can't quantify an estimate of the premia that the Authority might expect:

> ### Shape premium
>
> Since there is more uncertainty about how shape factors will change in a more renewable world, there is more risk associated with selling shaped contracts for the future. This means these shape premia could be even higher.
>
> ### Illiquidity premium
>
> We note however that our estimated competitive OTC prices will therefore likely be underestimated.
>
> ### Spot price volatility premium
>
> Again, due to the complexities involved, we have not attempted to estimate this premium, and therefore our estimate of competitive contract prices is a lower bound.
>
> ### Scarcity premium
>
> But it must be considered when comparing our estimated competitive contract prices to actual OTC prices that a lot of the time (especially due to current scarcity in the market) we will be underestimating contract prices.

ASX volatility premium

We did not attempt to add this premium to our estimated competitive contract prices due to the uncertainty involved in the calculation and in keeping with not adding other premia.

Having stated there is no evidence to say flexibility product prices are anything other than competitive the Authority says it can't estimate the premium but then wants to test if quantifying the premia would reveal whether the prices are competitive or not.

Impact of scarcity on contract prices

Above we have established that a wide range of factors have increased the risk associated with:

- A flexibility seller estimating their own wholesale exposure over the period of a potential flexibility contract, due to the combined concerns about the availability of hydro, gas and – at times – coal;
- A potential investor in firm capacity estimating the profitability of such an investment, in the context of gas uncertainty, demand uncertainty and policy uncertainty.

Scarcity of financial flex products is a function of physical scarcity in the sense of capacity and limits or uncertainty around fuel especially when the system is tight. Here, we are surprised that in 2023 the Authority concluded that:

> "The Authority is not aware of any reason to expect a shortfall in the ability to provide such contracts. This is because projections by Transpower and others indicate there should be sufficient generation physically available to meet energy and capacity standards for the next few years. This suggests that there should be the physical base to support the sale of contracts to meet likely demand. We also know that contracting can occur (and has occurred) using exchange-traded products, or on a bilateral basis….While the Authority does not have sufficient information to form a definitive view, it notes there is a long history of participants entering into backup contracts underpinned by thermal generation."[26]

As outlined earlier, by this time, concerns about the availability of gas supply were well known and the analysis conducted by Whiteboard Energy (see above) would have reported the gap that had emerged between peak demand and firm capacity. At that point, the Authority's proposed response was to make improvements to the electricity contract disclosure system.[27]

Throughout their "Price discovery in a renewables-based electricity system" project over 2021-2023, the Market Development Advisory Group (MDAG) routinely stressed the importance of contract markets in transmitting investment signals (underpinning capital investment and associated fuel contracts) through contracts. Their 2022 Options paper reported:

[26] Electricity Authority (2023) "Ensuring an Orderly Thermal Transition: Consultation Paper", 13 June 2023, para 4.37, 4.39.
[27] Ibid, para 4.38.

> "Effective risk management and efficient investment are heavily dependent on the contract market. Contracts are a key tool that wholesale buyers and sellers can use to manage their exposure to spot price risks. Forward contract prices also provide vital signals about where and when to invest, and about the best type of resource to develop."[28]

MDAG's proposed option in 2022 was:

> "We propose that the Authority work with market participants to co-design a standardised product (or products) which meets the needs of buyers and sellers (including providers of DSF) (Option B5). If trading of such products develops in the over-the-counter market, Option B1 would provide the **necessary transparency of the forward price of flexibility**. Alternatively, the outcome of this design process may be to list these products on a futures exchange."[29]

To MDAG's point, the only transparent forward curve today is the ASX; and the only product that is liquidly traded on the ASX is a baseload contract. A baseload contract hedges the average price level (over a season or a year); as argued above, the economics of peak supply bear little relation to the average price level – it is peak prices that matter. This is the fundamental reason MDAG argued strongly for a standardised flexibility contract – to provide price discovery of the upper part of the PDC.

We are encouraged that this process has just, at the time of writing,[30] resulted in a super-peak product being chosen by the Authority as the standardised flexibility product MDAG recommended in 2022.

However, over the period which the Authority has analysed super-peak prices (Q4 2022 to Q2 2024), no such standardised contract or transparent discovery of the price of flexibility was in place, and – at least for the first half of that period – all of the attendant uncertainties described in Section 2.1.1 were manifesting. While the change of government in Q4 2023 removed the prospect of Lake Onslow, gas concerns only intensified., and the risk of Tiwai existing remained until the end of May 2024. Drawing on Kaur et al[31], the consequences of energy policy uncertainty, Onslow, gas availability, coal pricing and Tiwai risk would have been imputed into the availability and pricing of the few peak and super peak products that were being traded bilaterally.

Ideally, a potential investor in peak capacity should have been able to underpin an investment in peak capacity through the supply of peak and super peak contracts. However, there are two issues:

- Bilaterial contract markets are 'dark', in the sense that only the counterparties to deals (traded or not traded) discover prices. Hence these prices were undiscoverable to the broader set of investors who may have been able to invest in firm peak capacity

[28] MDAG (2022), Price discovery in a renewables-based electricity system: Options paper, para 3.28
[29] Ibid para 3.38
[30] https://www.ea.govt.nz/news/general-news/energy-competition-task-force-announces-new-standardised-super-peak-hedge-contract-trading-begins-in-january/
[31] Kaur, C., Siddiki, J., & Singh, P. (2024). The asymmetric impact of input prices, the Russia-Ukraine war and domestic policy changes on wholesale electricity prices in India: A quantile autoregressive distributed lag analysis. *Energy Economics*, *132*, 107428. https://doi.org/10.1016/j.eneco.2024.107428

- Even if peak and super peak prices were transparently 'high', the challenge for an investor wanting to respond to this signal was the demand, supply and policy uncertainty over the medium term.

It comes as a surprise that the Authority reports the evidence on prices for flexibility products shows they are competitive but may elect to pursue a "plausible driver" that prices or availability may somehow not be consistent with a competitive market.

The Authority expresses concern that "offer prices for super-peak contracts could be consistent with a lack of competition, or simply reflect scarcity."[32] The Authority considers a premium would be payable for scarcity in a competitive market but is unable to estimate that premium.[33]

One of the basic themes of economics is that resources available to decision-makers are always limited. With limited resources, a decision to have more of something is simultaneously a decision to have less of something else. Hence, the opportunity cost of any decision is the foregone value of the next best alternative that is not chosen.

In a well-functioning market, the observed market price of a service will likely be closely tied to its opportunity cost. A provider of a service is unlikely to maintain the service if it does not receive at least what it would earn utilising the resource in its next best alternative. Prices would need to rise to at least match those obtainable in the next best alternative to maintain the service, including attracting new investment if the service is to be provided over time. If the provider attempts to raise prices above opportunity cost, it would risk losing market share to providers willing to provide the service for less (that is, at a price that reflects their opportunity cost) or suffer falling demand if the price exceeds consumers opportunity cost.

A payment over and above opportunity cost is called in economics a 'rent'. A 'scarcity rent' is said to occur when the supply of a (fixed) product is limited in relation to demand. If all units of a (fixed) product are homogeneous—the textbook example is land—and demand exceeds supply, all units of the product will earn an economic rent.

In a competitive market with low entry costs (an important assumption), scarcity rents will on average equal the cost of new capacity over time. However, the efficient level of scarcity rents in the short-term is not observable and is measurable only in hindsight; that is, if the present value of relevant prices turn out to equal the LRMC of new capacity of over the observation period.

These economic concepts highlight two difficulties in the Authority's musing:

- It has not attempted to estimate whether the revenue earned by a supplier of super-peak capacity would exceed the LRMC of new entrant *firm* capacity—if the revenue earnt by an existing supplier is less than that required by a new entrant, the supplier cannot be said to have exercised market power in a manner adverse to the long-term benefit to consumers.
- The tightening of firm capacity relative to peak demand clearly evident in the market in recent years suggests barriers to investment either due to regulatory uncertainty (e.g., Onslow) and market uncertainty (e.g., Tiwai) or *under-pricing* of peak capacity or some combination of

[32] Electricity Authority, (2024), *Reviewing risk management options for electricity retailers – issues paper*, para 2.7
[33] ibid, footnote 6.

both. There are indicators that regulatory and market uncertainty has reduced, but whether market prices provide a sufficient signal for firm capacity remains unclear.

3.2 What should the Authority do?

In summary, it is our view that the challenges of determining the quantum of market power in a small sample of super peak contract pricing during a period of significant scarcity risks a mis-diagnosis. This, in turn, may lead to a regulatory intervention which is disproportionate to the problem. Pursuing forward price transparency and liquidity for flexibility products is a better use of resources; achieving these objectives means continued close attention to investment incentives.

We recognise that this will be cold comfort to flexibility purchasers (e.g., independent retailers) who are feeling the brunt of high super-peak prices. Our analysis above suggests that some of the risks associated with firm capacity investment have passed, and investment is coming to market in forms of demand response and battery storage that could plausibly back the standardised super peak contract.

This investment is a prerequisite for the availability and efficient pricing of peak-related contract is the availability of flexibility capacity (including demand reduction). Any peak-related contractual obligations that cannot be met physically ultimately result in the supplier being exposed to wholesale market prices for any shortfall.

As recommended by MDAG[34], there may be a role for market-making at a future date following the release of the standardised flexibility contract. MDAG reinforced that the Authority should not move straight to market making, referring to this as a 'backstop measure for use if required'. While MDAG didn't propose specific metrics, we recommend that the Authority should make it clear to the market how long it would allow for liquidity to grow, and on what basis it would judge that trading and price discovery of flexibility was insufficient, if the expected workings of a competitive market had not succeeded.

Any move to market making, should it be necessary, would require consideration of the likely costs of market making, and a range of other design features[35]. Absent sufficient investment in flexible capacity, regulatory interventions such as market making can risk unintended consequences. If the underlying problem is scarcity of peak supply (as has been the case), an entity subject to market making could be at risk of being caught with a trade that cannot be backed by physical generation and the inability to purchase cover. Unless carefully designed, the result could exacerbate regulatory risk in the market and discourage new entrant investors (who would reasonably be concerned they would be subject to the same intervention), the opposite of what was intended from the intervention.

4 Appendix – summary of historical System Operator security assessments

- SOSA 2018 - Reduced generation availability in conjunction with the Low Carbon and Electrification scenario will mean the North Island WCM may fall below the North Island WCM security of supply standard in 2020, and a significant amount of new generation options would need to be developed from 2023 as currently known options would be insufficient from this point. With only currently known generation options, the margin may fall below zero in 2026.
- SOSA 2019 - The North Island WCM is forecast to remain above or within the security standard until 2022, with existing and committed generation in the base-case scenario.

  Under the medium demand scenario New Zealand will need to commission around 150 GWh of new winter generation by 2024. In all three scenarios new generation will need to be consistently added in the mid to late 2020s, up to 1,700 GWh of winter generation in 2028 in the medium scenario.
- SOSA 2020 - In all four scenarios, investment in new generation will be required by 2025 - 2026 in order to maintain North Island Winter Capacity Margins at an efficient level of reliability (that is, where the expected cost of supply shortages is equal to the expected cost of new generation).

  For the medium demand and High demand scenarios new generation is required earlier to maintain North Island Winter Capacity Margins in part due to the type of generation projects that are currently being actively progressed. Over half of this capacity is wind generation, which contributes a relatively smaller amount to North Island Winter Capacity Margins than to the Winter Energy Margins.
- SOSA 2021 - On the evening of 9 August 2021 record high peak demand and unexpected supply shortages lead to demand curtailment. Our North Island winter capacity margin analysis assumes all thermal generation is able to contribute its full capacity and that peak demand is assessed as the average of the top 200 half hourly demand winter peaks. In contrast, on 9 August market conditions were such that not all thermal generation was available and peak demand was well above the average of the top 200 half hourly demand winter peaks.

About Sapere

Sapere is one of the largest expert consulting firms in Australasia, and a leader in the provision of independent economic, forensic accounting and public policy services. We provide independent expert testimony, strategic advisory services, data analytics and other advice to Australasia's private sector corporate clients, major law firms, government agencies, and regulatory bodies.

'Sapere' comes from Latin (to be wise) and the phrase 'sapere aude' (dare to be wise). The phrase is associated with German philosopher Immanuel Kant, who promoted the use of reason as a tool of thought; an approach that underpins all Sapere's practice groups.

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