

Submission by



to the

**Electricity Authority**

on the consultation document

**Potential solutions for peak electricity capacity issues**

1 March 2024

**– SUBMISSION BY THE BUSINESSNZ ENERGY COUNCIL –**  
**POTENTIAL SOLUTIONS FOR PEAK ELECTRICITY CAPACITY ISSUES**

**Summary of recommendations**

1. BusinessNZ Energy Council (BEC)<sup>1</sup> welcomes the opportunity to submit on the Electricity Authority's consultation paper [\*Potential solutions for peak electricity capacity issues\*](#).
2. **We support the Authority's work to investigate whether current market arrangements are adequate** to address periods of tight capacity, especially during winter 2024/25 and beyond.
3. **We are deeply concerned about the tightening capacity margins and flexibility in the electricity system.** Urgent measures are needed to address uncertainties around new flexible capacity.
4. Despite recognizing the important role of gas and market signals for peaking solutions, doubts remain about their timely delivery, **prompting the need for mechanisms that incentivise and strengthen system resilience.**
5. **We generally agree with the Authority's criteria for assessing options**, which aim to solve the problem while protecting overall system goals. However, particularly during this transitional period, **we urge equal attention to reliability alongside market efficiency considerations**, given the evolving nature of the electricity system.
6. We back the Authority's move to improve battery storage market access, which can enhance flexibility during peak times. However, **we think more focus should be on ensuring timely delivery of peaking capacity and demand response at the least cost.** While battery storage helps during short periods of imbalances, it's limited during prolonged conditions.
7. **We support the concept of an integrated standby ancillary service.** Integrating the service into the spot market ensures efficiency and diverse resource incentives. Considering the time it would take to develop, it could be an option for the medium term. Immediate solutions are likely necessary to tackle peak capacity issues in the meantime. Such measures should be the least cost, least regrets, with the least unintended consequences.
8. **We recognize the potential of short-term solutions like out-of-market contracts to quickly address capacity issues but acknowledge their risks.** Enhancing demand-side flexibility is crucial for system security, but incentivizing participation presents challenges. Short-term measures outlined in the paper will also take time to implement and may not be ready for Winter 2024 and 2025.
9. Considering both short and medium-term options may not be available in time to address immediate challenges, **we also support measures that would strengthen Transpower's monitoring and co-ordination capabilities.**
10. Overall, the paper outlines the costs and benefits of each option well. However, **we recommend the Authority consider contextual factors and assess these options against the cost of disruption from a whole-of-economy perspective.** A wider assessment of the costs associated with the largely status quo option could illustrate the need for a set of measures that protect security of supply, despite such measures being suboptimal.

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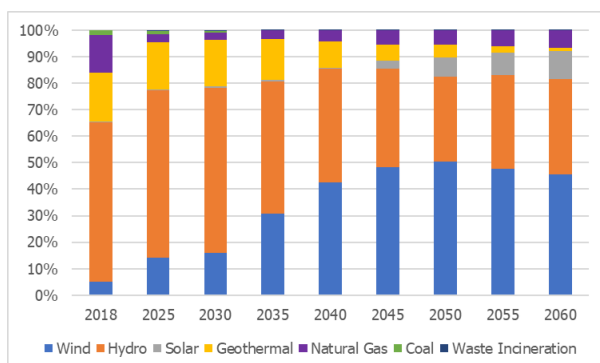
<sup>1</sup> More about BusinessNZ Energy Council can be found in appendix one

## Outlining the problem

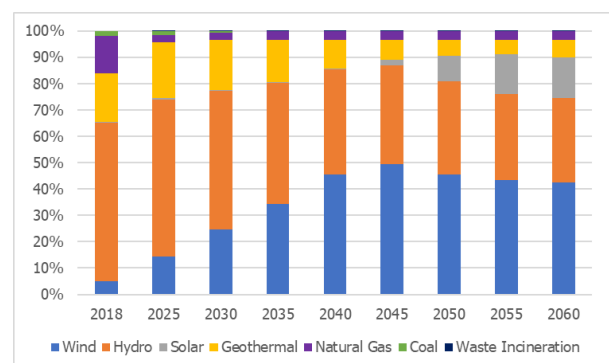
1. **We are deeply concerned by the growing incidences of tight capacity margins and the deteriorating capability of the system's flexible resources.** Last winter highlighted several moments where demand almost outstripped supply. Eight low residual situations occurred. Four of them would have escalated into grid emergencies without the help of industry. Fortunately, favourable lake levels and system management avoided widespread blackouts. Looking ahead, Transpower has highlighted the elevated risks in 2024 compared to 2023. Despite new baseload geothermal plant expected to be operational in 2024 and 2025, reserves will remain tight over the next two to three years.
2. Ensuring sufficient resource adequacy, especially during peak periods, **is the most immediate and pressing challenge facing the electricity system.** The challenge is complicated by project delays, providing uncertainty over whether new capacity will be available in time to offset the planned closure of some thermal generation.
3. The Authority rightly understands the lack of political, social, and economic tolerance for blackouts, **but under current market arrangements adequate flexible resources will not be supplied at the scale and pace required** to avoid periods of extremely tight capacity.
4. The system's reliability in 2024, and throughout the short-term, is compromised. It has risen to an increasingly unacceptable level – as shown with frequent low residual situations in 2022 and 2023 – jeopardizing security of supply. This runs the real risk of costly disruptions and upward pressure on wholesale prices.
5. Prices have been elevated over the past five years, providing strain on businesses and in particular large energy users. Continuing high prices, attributed in part to insufficient flexible capacity, is likely to be unsustainable for many businesses. These businesses are also tasked with electrifying their processes. A lack of flexible capacity, placing pressure on wholesale prices, would impact consumer confidence in achieving broader system objectives, adversely impacting efforts to electrify and meet New Zealand's obligated emission reduction targets. Simply said, unaffordable prices will not deliver the intended emission reductions.
6. Undoubtedly, the system cannot be perfectly reliable. A reasonable amount of risk is acceptable in the face of increasing consumer costs for additional reliability. An over procurement of resources could adversely impact energy affordability and sustainability. An optimal balance is required. Thus, the trade-off between the cost of new peaking and the cost of an energy shortfall is a suitable principle to assess whether security standards are acceptable.
7. As noted in the paper, in 2021 and 2022, the amount of acceptable energy shortage measured in hours before more investment is needed was far below the suggested level of 22 hours per year, indicating a secure system. Yet we note that the standard has not been updated since 2012. An updated standard that better reflects the current system and its level of efficient reliability could show a different conclusion.
8. A review of the standards has not occurred in close to seven years. Over this period, the system has changed in many ways that have impacted the system's reliability and relevance of the current standard. For example, the thermal unit commitment problem has become more pronounced as the cost of committing has increased, providing co-ordination challenges.

9. The balance between supply and demand as per the standard is increasingly no longer largely driven by the function of capacity but by the function of capacity made available. The current standard is therefore becoming more detached from the current system in 2024.
10. Since the standard’s review in 2017, the electricity system has become even more dependent on ageing equipment that responds to increasingly volatile pricing. Stress is being applied to thermal kit not designed to operate flexibly and cope with unplanned outages. Unplanned outages, within expected operating norms occurred during 2023, highlighted the lack of preparedness for expected but unplanned outages. These outages are expected to increase in frequency due to the systems reliance on aging assets with declining reliability.
11. Another unplanned outage, coinciding with a cold snap of high demand with low wind generation or inflexible hydro, spells for serious risks to security of supply. A prolonged outage or would provide more costly and widespread consequences.
12. The market is helping to signal the need for more peaking solutions. It can be said that several solutions are in response to stronger signals sent during periods of increasing scarcity. This includes the increased deployment of time-of-use tariffs by many retailers and the growing use of contractual arrangements with inbuilt flexibility.
13. Yet despite the market signalling the need for more flexible resources, under current arrangements, the wider incentives to participate in demand response (DR) and deliver peaking is shaky. This is of concern as Transpower has repeated the urgent need for more demand-side flexibility and new fast-start peaking generation to reduce the heightened risks to security of supply. **We voice Transpower’s call for a rapid deployment of DR and more peaking generation. Yet this will not occur if participants are not adequately incentivised to supply the service.**
14. There is widespread acknowledgement across the sector that during the transition gas will play a vital role until other technologies substitute thermal firming. The need for more peaking generation is reflected in multiple models. According to the TIMES-NZ modelling, New Zealand’s electricity system is likely to need natural gas, with gas peakers playing a role beyond 2030 all the way to 2060, both in Kea and Tūi, as shown in Figure 1 and 2 below, ensuring a backup to intermittent sources. Kea needs an additional 200MW of new thermal plant by 2030, and Tūi requires 400MW by 2030.

**Figure 1: Kea electricity generation**



**Figure 2: Tūi electricity generation**



*Note in purple and green, the ongoing role thermal plays in firming out to 2060.*

15. BCG estimates that a total of 400MW of battery storage and 700 MW of gas peaking capacity would be needed to meet the highest 2030 demand peak.<sup>2</sup> The Climate Change Commission shows a similar need for fast start peaking.
16. The Government's reversal of the 100% renewable target and the NZ Battery Project deflates considerable uncertainty and helps reduce investors unease in new thermal capacity. The Government's reassurance of the role of gas is also welcomed. But despite thermal peaking remaining the least cost, lowest emissions approach to maintain security of supply, investment confidence in new fast start peaking capacity is weak. Investment risk is still too high. Gas supply uncertainty provides complications. Supply is already constrained, and demand is likely to outstrip gas supply between 2025 to 2027 if urgent investment does not occur.<sup>3</sup> Even with 2C resources coming online, production from all sources could be insufficient between 2028 and 2034.<sup>4</sup>
17. A peaker also will run in short durations and will likely experience difficulty making a sufficient payback over its lifetime. To provide adequate confidence and strengthen incentives, a market mechanism aimed at incentivising investment to ensure a peaker is built becomes more warranted.

### **Principles and criteria for intervention**

18. The Authority's criteria for evaluating each potential option distinctly outlines several desirable outcomes to judge against, ensuring any intervention addresses the problem while avoiding the deterioration of wider system objectives. Broadly, we are satisfied with the Authority's evaluation criteria.
19. The Authority's assessment of each option should ensure it evaluates against its entire statutory objective and it should be applied consistently. The criteria already include "meets the Authority's statutory objective." However, we are concerned that additional importance has been placed on market efficiency disproportionately.
20. The efficient operation of the wholesale market, protecting price signals and avoiding distortions, is vitally important but the reliability limb of the Authority's statutory objective, and its risks to consumers, should not be downplayed. Instead, it must be given equal consideration. This is especially evident during this consequential period of the transition, as the system evolves to a more intermittent profile with spiker peaks and more volatility, highlighting serious security of supply challenges.

### **BESS and the need for new fast start peaking capacity.**

21. The paper notes that one of the Authority's areas of focus in the short-term is on improving market access for battery storage. **We support the Authority's work to introduce a 'bi-directional' offer for BESS** to allow participants to signal price bands they would be willing to charge and discharge. The change would likely be a worthwhile step to optimise BESS and improve its operation in the market. BESS is a valuable technology contributing to more flexible storage, helping to ease some pressure during peak periods. Examples include Meridian's Ruakākā battery and batteries dispersed across Vector's network.
22. Despite the value of BESS and Authority's valuable actions to improve the market function of BESS, **we believe the Authority's focus would be better applied to implementing**

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<sup>2</sup> *The Future is Electric*, Boston Consulting Group

<sup>3</sup> *Gas supply and demand study 2023*, Gas Industry Company, 2024

<sup>4</sup> *Ibid*,

**measures that ensure peaking capacity and DR is delivered at pace, at the least cost to consumers, with the least unintended consequences to market efficiency.** We are not confident that optimising current arrangements for BESS, despite being valuable, will deliver the required flexibility through Winter 2024 and across the short-term to protect security of supply and keep the lights on.

23. While BESS currently provides some cover during short durations of imbalances between supply and demand, the capacity provided is limited over prolonged periods of cold and windless conditions.
24. Under current circumstances, with uncertainty surrounding future technology, the only viable firming technology to provide adequate security *across all time periods and conditions*, is currently thermal generation. Beyond 2030, it is likely hydro will play a more flexible role with more demand-side response. Until then, New Zealand's system needs to retain thermal capacity. Measures to ensure thermal capacity is adequate throughout the transition, avoiding a disorderly exit, would provide considerable value.

### **The potential options to address peak capacity issues**

25. **We support the concept of an integrated standby ancillary service.** The need for this product has been voiced by MDAG and many across the sector. It has become increasingly important as intermittent supply makes up a growing portion of overall generation with the risks of capacity shortfalls growing. Such a product could provide more cover for sudden falls in wind and solar generation – reducing the likelihood of blackouts.
26. We agree with the Authority that one of the main benefits of this product is its integration within the spot market, minimising any distorting effects, upholding technology agnosticism, protecting efficient price signals, and ensuring the deployment of the least cost combination of resources. Payments to providers of standby reserve would likely better incentivise resources that are increasingly not being called upon but provide much needed flexibility.
27. It is clear an integrated service will create an additional cost to consumers. Since all participants benefit from additional security at a system level, cost sharing across all purchasers is reasonable. However, **before progressing with this option, we recommend the costs must be quantified against the benefits of avoiding disruptions and protecting security of supply.**
28. The Authority notes that adopting the service would likely take one to two years. The challenges facing security of supply is immediate. Solutions for Winter 2024/25 are needed, and this option will not be ready. In the near term, during the possible implementation period of an ancillary product, investments might be discouraged as participants wait to see how the service will function.
29. Once in operation, the signals sent by an ancillary service might take longer to flow through to an investment decision. How long that would likely take is unknown. There is also still uncertainty about whether the service would adequately send sufficient incentives that justify peaking investments with wider risks.
30. By the time of implementation, the Authority notes that it might not be needed as the problem might become less pronounced, with more batteries and demand response entering the market. However, caution should be applied. There is a degree of uncertainty about the cost trajectory of BESS, the ability of BESS to cover longer durations in the future and innovation in DR across the short-term.

31. Peak capacity issues could be an enduring problem lasting longer than the Authority anticipates. Hesitation to implement an ancillary service on the grounds that it won't be needed beyond the short-term assumes that market solutions to the peak capacity issue will be solved in the short term. At this stage, it is difficult to be definitive about future solutions.
32. Overall, considering an integrated ancillary service does not address the immediate need for more flexible resources, the implementation of an ancillary service would be best implemented as an option for beyond Winter 2024 – if the benefits outweigh the costs – incentivising adequate capacity in the medium term. If this option is pursued, the Authority should meaningfully involve and collaborate with industry on its design. To better address the current problem, short-term measures should reduce the probability of widespread and reoccurring blackouts in a timely manner.

### **Out-of-market contracts**

33. The paper outlines the merits and pitfalls of more short-term solutions. This includes contracts for out-of-market resources, with a predefined contract payments to make resources available at times of low residual. **Depending on its design, this option could be effective at incentivising the required build of peaking capacity or industrial flexibility.** It would likely be a fast and less complicated option to implement, ensuring that the peak capacity issues facing the system in the short-term is addressed, significantly reducing blackout risk.
34. This option could have more unintended consequence on market efficiency compared to a market integrated ancillary service. It could weaken market signals, reduce the incentive for participants to self-insure, possibly undermine demand-side innovations and muddy New Zealand's comparatively undistorted spot market.
35. Ultimately it could risk picking a technology, acting as a subsidy that is higher than spot prices, with costs being passed to consumers. Out-of-market contracts could risk comparatively expensive plant remaining in the market for longer than is required, while counteracting the purpose of the ETS in incentivising less emission intensive generation.
36. If this option is pursued, there is uncertainty to whether it could be implemented in a timely manner. As noted, it would likely take less time and resources to introduce this option compared to integrating an ancillary standby service. However, finalising a contractual agreement both for plant and gas supply would consume time. Construction would prolong the timeline. This raises questions to whether this option would solve the immediate problem.
37. Although the option has a higher risk of unintended consequences compared to alternative options outlined in the paper, **its wider costs and benefits should be quantified before the Authority rules out this option. This assessment should consider the costs of disruptions, its impacts on efforts to electrify and the costs to the wider economy resulting from inadequate capacity.** From a whole-of-economy perspective, a wider assessment of the cost and benefits of this option might show more benefits than initially conceived. In doing so, it could ensure capacity is delivered on time, protecting security of supply, and reducing the potential cost across the economy.

### **Measures for demand response**

38. The value of unlocking more demand-side flexibility is clear. It will reduce the need for new transmission, distribution, and generation infrastructure, delivering savings across the system. The value of DSF is currently on display. Technological developments have led to aggregators

offering flexibility services without the need for consumers to directly respond to price signals. Dynamic Operating Envelopes and the use of more flexible connections, as shown for e-bus charging in Auckland, have reflected value in a more efficient network.

39. In addition to improving the functioning of BESS, the Authority advances that among its short-term efforts to address the peak capacity problem, improving participation in the dispatchable demand product launched in 2023 should be a priority. We believe the solutions mooted, which include addressing operational concerns of plant being dispatched on too soon, the introduction of a 'return time' constraint and ramp rates to dispatchable demand bids, might reduce friction and possibly improve participation. The Authority has listened to users' perspective concerning the physical constraints facing plant and demand response. Thus, this work is a step in the right direction.
40. The system will likely need far more demand response than current levels, as assumed by MDAG, and reiterated by Transpower, as generation becomes increasingly intermittent and volatile. Efforts to improve demand-side response are needed as active demand participation, despite increasing, is still undeveloped and not mature. There is however a fine balancing act in improving the current incentives for demand-response and adversely impacting innovation in this emerging and evolving field, as highlighted by MDAG.
41. Putting aside its pitfalls, the RCPD incentivised demand response and shaved pressure off demand peaks. Users and networks were given adequate and clear signals to participate. Its removal has weakened the incentives to undertake demand response. In Auckland, there was a 7% increase in peak demand after RCPD was removed.<sup>5</sup> This highlights the need for swift solutions to encourage demand response. **The absence of measures to control load by encouraging demand response is of concern.**
42. Under current arrangements, the economic viability of demand response at scale is challenging, especially for sizeable industrial users who could provide the needed flexibility. We are concerned that actions aimed at reducing participation barriers in the dispatchable demand regime might not address the root problem of inadequate incentives.
43. Participation in demand response at a large scale requires significant investment in capital and operating expenditure for plant and process modifications. There are concerns that the financial gains from participation fail to justify the investments required.
44. This disincentive is even weaker when production curtailment would occur without sufficient incentives. Without adequate remuneration for demand response, the prospect of demand response loses its attractiveness, as businesses understandably would be reluctant to reduce production and adversely impact their customers.
45. Currently, in the case of 5 minutes to half-hourly real time pricing, the price signal must be extremely elevated and extend far beyond one trading period for demand response to be worthwhile for industrial users to contemplate participation. The signal must be clear, justifying lost production and provide sufficient time in advance to plan for load reductions, minimising disruption to operations and production while protecting plant integrity.
46. Put simply, users will not switch off plant without a strong signal and adequate notification. Turning off load, including the time to restart, can take four hours or longer. Reducing load in short notice could translate to long disruptions in operations lasting up to possibly 12 hours.

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<sup>5</sup> TeslaForecast (2023)



Since the reversal of RCPD, current arrangements do not provide the same level of peak signal and sufficient notice for industrial users to reduce load and help reduce peak demand.

47. This is now problematic if there is insufficient demand response at the volumes required to mitigate against loss of load, especially if new firming capacity is not onstream in the short to medium term. **As a sector, if we decide we want more demand response, sufficient compensation and rewards will have to be in place. No one will do it unless there is an incentive to participate.**
48. An out-of-market tender for demand response or the introduction of a market-based mechanism that rewards demand response, channelling these benefits back to the affected consumers offering demand-side flexibility, emerge as a possible solution that could be implemented swiftly and address the problem.
49. We agree that these two options could unleash unintended consequences and costs as outlined in the paper. Before the Authority concludes whether work on these demand-side solutions proceed or do not proceed, we recommend current contextual factors concerning peak capacity constraints must not be forgotten. **As noted, a full assessment that explores the costs of system disruptions, its impacts on efforts to electrify and the costs to the wider economy resulting from inadequate capacity should occur to better assess whether this option is necessary.**

#### **Strengthening Transpower's capability**

50. Over the past two years, Transpower has overseen the effective management of the system, ensuring agile coordination to keep the lights on. Over the short-term, it is imperative that this effective management continue as the system remains increasingly constrained. **We endorse the adoption of measures to enhance monitoring and coordination,** thereby reducing the risk of inadequate cover over peak periods.

## Appendix One - Background information on BusinessNZ Energy Council

### About the BusinessNZ Energy Council

The [BusinessNZ Energy Council \(BEC\)](#) is a group of New Zealand energy organisations taking on a leading role in creating an affordable, reliable, and sustainable energy system for New Zealand. The BEC is a division of BusinessNZ, New Zealand's largest business advocacy group and the New Zealand Member Committee of the [World Energy Council \(WEC\)](#). The BEC offers a unique opportunity to shape the New Zealand's energy-system with business leaders, government, and research as well as access to global thinking on energy issues via our involvement with WEC.

### About the World Energy Council

The World Energy Council is an independent global organisation that promotes an affordable, reliable and sustainable energy system for all. It is comprised of over 100 member countries. The Council provides impartial information on critical issues that affect society's well-being such as climate change mitigation strategies; energy efficiency; renewable energies; nuclear power; clean coal technologies; rural electrification; energy access; regional integration; urbanisation; geopolitics; innovation; finance; human capital; governance; resilience; hydrogen; storage; digitalisation; mobility; cooling; heating; behaviour change; scenarios; and transition leadership.

### About the BusinessNZ

[BusinessNZ](#) is New Zealand's largest business advocacy body, representing:

- [BusinessNZ Energy Council](#) of enterprises leading sustainable energy production and use
- [Buy NZ Made](#) representing producers, retailers and consumers of New Zealand-made goods
- Regional business groups [EMA](#), [Business Central](#), [Canterbury Employers' Chamber of Commerce](#), and [Employers Otago Southland](#)
- [Major Companies Group](#) of New Zealand's largest businesses
- [Gold Group](#) of medium sized businesses
- [Affiliated Industries Group](#) of national industry associations
- [ExportNZ](#) representing New Zealand exporting enterprises
- [ManufacturingNZ](#) representing New Zealand manufacturing enterprises
- [Sustainable Business Council](#) of enterprises leading sustainable business practice

BusinessNZ is able to tap into the views of over 76,000 employers and businesses, ranging from the smallest to the largest and reflecting the make-up of the New Zealand economy. In addition to advocacy and services for enterprise, BusinessNZ contributes to Government, tripartite working parties and international bodies including the International Labour Organisation ([ILO](#)), the International Organisation of Employers ([IOE](#)) and the Business and Industry Advisory Council ([BIAC](#)) to the Organisation for Economic Cooperation and Development ([OECD](#)).



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