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POWERING A BETTER NEW ZEALAND TOGETHER

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Electricity Authority

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Submission on Potential solutions for peak electricity capacity issues

Introduction

1. Energy Resources Aotearoa is New Zealand's peak energy sector advocacy organisation. Our purpose is to enable constructive collaboration across the energy sector through and beyond New Zealand's transition to net zero carbon emissions in 2050.

2. This document constitutes our submission on Potential solutions for peak electricity capacity issues.

3. In this submission we offer advice on two complementary measures for increasing peak demand flexibility through pricing, and the potential for long-term contracts offering gas into the annual electricity market more predictably. We also draw attention to a range of views about future electricity demand and potential requirements for new gas-fired thermal peaking capacity as back-up for the increasingly renewable system.

4. We have focused our submission on sections 4-6 , noting the consultation document discussion was light on thermal capacity solutions, which should not be ignored.

Submission

Familiar issues with winter capacity

5. We agree with the Electricity Authority's ('the Authority') assessment of the current state of the energy system and the issues that could lead to scarce supply in coming winters. Managing New Zealand's peak electricity demand is becoming increasingly challenging and urgent.

6. Reliance on large-scale demand response, from Methanex, Tiwai or any other large energy user in future, has seemingly become a structural part of the annual energy cycle. This is concerning. Large energy users should not be relied on to voluntarily reduce their demand at very short notice to keep the country's lights on.

7. High hydro levels and scheduled outages of Methanex's methanol plants during 2022-23 meant there was sufficient gas to meet electricity generation demand. It is uncertain the 2024 winter will be able to rely on these factors providing this buffer to the same extent. Demand response from the Tiwai Point aluminium smelter will provide additional security of supply this winter, but beyond 2024 there is no such guarantee.

8. We encourage the Authority to work with gas industry participants and large energy users of all fuel types when looking at long-term market measures for securing winter capacity. Our preference is to let the market find solutions within stable, predictable, and enabling policy settings.

New measures

9. We don't agree that the risks of scarce supply necessarily need to be managed by over-building new electrical capacity that the market may not use. Indeed, we are unsure who would finance such an overbuild. As the Authority rightly asserts, there is no 100% secure energy system in the world. Rather, New Zealand needs supportive and stable policy and price settings to shore up investor confidence. The market can then provide the necessary signals to energy producers to meet peak capacity demands and avoid the material risks of blackouts.

10. We agree that investment in higher levels of reliability will impose additional costs on consumers. As with the fuel industry's Minimum Stockholding Obligation, any investment in over-supplying the market must strike an appropriate balance between resiliency and the costs imposed on the supply chain. We believe that the market is best placed to find supplies at short notice if and when needed, and that these will be priced accordingly. Importantly this potential shortfall provides a valuable signal for investment in new generation or demand response. Under the right conditions this should include gas-fired fast-start peakers.

11. Capacity markets are, by nature, costly and potentially un-competitive due to the information asymmetry problems associated with them. They are a legitimate option to be considered, however we believe that new measures are not currently required. However, the risk of a disorderly phasedown of thermal generation needs to be monitored and carefully managed. If new measures are favoured by the Authority, following consultation, we recommend market-led options be preferred.

12. We support investigation of two complementary options, below.

Option one: Short term over-the-counter wholesale products

13. A key distinction where we think new measures might be justifiable is between intra-day flexibility and intra-season or inter-year flexibility, for which natural gas storage and fast-start 'peaking' generation capacity remain the most obvious solutions in the medium- to long-term. Introducing flexibility measures in the

near-term would provide the investment confidence needed for these longer-term solutions.

14. We are supportive of the option for the development of 'new flexibility products (standardised)' or short-term over the counter products (OTC) which can be offered to the wholesale market.[1] These would have the purpose of allowing an electronic marketplace to facilitate the wholesale OTC trading of New Zealand electricity contracts. We are aware of at least one market participant ready to offer such a product. The marketplace has been designed to improve the commercial viability of market participants responding to market conditions during periods of energy scarcity in the coming and subsequent winter seasons.

Option two: Transmission congestion charging

15. Another option, not included in the consultation paper, is the re-introduction of transmission congestion charging. Transpower has recommended this and we think it could be a low-cost option to bring peak demand down through market signals. For large energy users to reduce demand there needs to be a clear price signal that makes reducing load worthwhile and not likely to vanish after committing to a reduction. This signal also needs to be sufficiently strong to compensate for loss of production.

Price signals and price settings

16. In a workably competitive electricity market, which we argue includes all fuels that create electricity, the market is best at finding solutions to supply issues through pricing. Price signals incentivise investors to find opportunities to innovate and grow the economy through generation, network, and technology improvements when they are economically viable and available.

17. Distorting market incentives will shift investment to higher-cost, lower-value options. To balance the energy trilemma, long-term market investment is required, with stable policy and price settings that the market can predict.

Battery storage and flexibility

18. We believe the best battery is the most affordable battery. We look forward to understanding how the work completed to date on the NZ Battery project might be taken forward in a way that fits with the new Government's priorities. We strongly recommend an unbiased approach that takes account of all fuels and technologies that create energy, and affordable options for storage.

19. We also encourage the Authority to investigate long term arrangements for offering gas to the market more predictably. Over the last three years, Methanex has played a role in freeing up gas in winter for power generation. Currently,

1 MDAG report, recommendation 8.

Methanex's demand response tends to occur when circumstances allow or demand it, but reduced gas supply limits Methanex' ability to do so. It is expected that the next three winters will have similar demands for gas, and industry consultants have suggested that Methanex' demand response should become a structural feature of the gas-electricity sector.[2]

20. If a longer-term more structural solution is seen as desirable, then it may be possible to develop commercial terms that allows gas to be offered into the market more predictably.

Long term demand response for winters beyond 2024

21. Meridian Energy has recently secured an additional 20 MW of demand response from the Tiwai Point aluminium smelter for the coming winter. The agreement is on top of the 50 MW of demand response agreed with the smelter last year and expires at the end of this year. This agreement means New Zealand will be less likely to need to burn coal during peak periods and may reduce the demand for peak gas capacity this winter.

22. Beyond this winter, any new demand response capacity agreement will need to be sustainable over the long-term and have stable pricing, not to mention be agreeable to the contracted parties. We believe our gas market will have a role to play in securing energy supply over the long-term, particularly for hard-to-abate large energy users and for the national grid. We encourage the Authority to consider gas market participants in future solutions that come forward from this consultation, particularly as Tiwai's now 70 MW of winter capacity is not assured beyond this year.

23. The government is mindful of the short-term risks to energy security and is investigating a range of measures that might enhance near term gas production under the right conditions. It is important that the Authority does not foreclose options, should the new government's policies revitalise gas production. If this should materialise, it is important that the Authority's policy settings are receptive to the potential for an abundant source of gas. Having a diverse range of peak capacity fuels and technologies, and settings that enable the full range, will ultimately lead to a more resilient electricity market.

Varying views about future demand

24. We draw attention to the range of views summarised in the table below on future electricity demand, as well as the need for new thermal peaking capacity (note in many cases this new capacity is offset, at least partially, by the decommissioning of existing slow-start capacity). Note that these reports use different reference

2 Between 2021 and 2023 Methanex made available, on average, approximately 4 PJ per year of winter gas for power generation. Methanex estimates that its demand response in the gas market enabled between 150 and 200 MW of winter electricity generation capacity (depending on where the gas was used and over what time period it was used in winter).

periods and timeframes, so these figures are not necessarily directly comparable. Relevant years are noted to assist.

25. This difference of views illustrates the breadth of uncertainties around the future of thermal capacity, and the need for system settings to retain optionality. Given the current government's appetite for revitalising the gas sector, it is also important to be able to respond to changing circumstances, particularly given the economically and socially damaging consequences of a disorderly thermal transition.

Date	Report	Total electricity demand	New thermal peaking capacity
May 2023	Concept Consulting's report for the Electricity Authority[3]	50 TWh in 2032	None, at least until 2032
Apr 2023	EnergyLink's Role of Gas in Electricity and Industry[4] Low demand and high demand cases (note these only run to 2038)	Low demand: 46 TWh in 2038 High demand: 54 TWh in 2038	Low demand: 200 MW by 2035 High demand: 320 MW by 2035
Oct 2022	BCG's The Future is Electric[5] Preferred pathway (Smart System Evolution)	54 TWh in 2030 77 TWh in 2050	200 MW by 2030 400 MW by 2040 600 MW by 2050
May 2021	BusinessNZ Energy Council's TimesNZ 2.0[6] Kea and Tui scenarios	Kea: 45 TWh in 2030 75 TWh in 2050 Tui: 54 TWh in 2030 83 TWh in 2050	Kea: 200 MW by 2030 1,830 MW by 2050 Tui: 400 MW by 2030 1,770 MW by 2050
May 2021	Climate Change Commission's *Inaia Tonu Nei*[7] Demonstration pathway	50 TWh in 2035 66 TWh in 2050	200 MW by 2035
Mar 2020	Transpower's *Whakamana I Te Mauri Hiko* base case[8]	55 TWh in 2035 70 TWh in 2050	400 MW by 2035

3 https://www.ea.govt.nz/documents/3147/Appendix_C_-_Concept_Consulting.pdf

4 https://www.energyresources.org.nz/dmsdocument/243

5 https://www.bcg.com/publications/2022/climate-change-in-new-zealand

6 https://times.bec.org.nz/

7 https://www.climatecommission.govt.nz/public/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa/Inaia-tonu-nei-a-low-emissions-future-for-Aotearoa.pdf

8 See Transpower's *Whakamana I Te Mauri Hiko* report, available at https://tpow-corp-production.s3.ap-southeast-2.amazonaws.com/public/publications/resources/TP%20Whakamana%20i%20Te%20Mauri%20Hiko.pdf?VersionId=FljQmfxCk6MZ9mIvpNws63xFEBXwhX7f

Date	Report	Total electricity demand	New thermal peaking capacity
Jul 2019	MBIE's Electricity Demand and Generation Scenarios[9] Reference and disruptive cases	Reference: 49 TWh in 2035 / 57 TWh in 2050 Disruptive: 55 TWh in 2035 / 71 TWh in 2050	Reference: 490 MW by 2035 / 930 MW by 2050 Disruptive: 940 MW by 2035 / 1,340 MW by 2050

Energy Resources Aotearoa report highlighting role for new gas peaking

26. We draw specific attention to our report on the role of gas in electricity and industry, commissioned by Energy Resources Aotearoa in 2023 and completed by Energy Link. This study found that new gas-fired peaking capacity is required in all modelled scenarios (see table below). As the market moves toward higher shares of renewable electricity capacity, the real need for gas-fired generation becomes centred on dry periods and peak demand to provide back-up for the intermittency of renewable generation.

27. This ranges from a new 200 MW plant in 2034/35 under the low demand scenario, to 200 MW in 2029/30 and 120 MW in 2032/33 under the high demand scenario.

Scenario	Electricity Demand in 2037/38	Rankine Units Retire	e3p Retires	Additional Gas-peaking Capacity Built
Low Demand to 2027	46 TWh	2024	2033	200 MW, 2034/35
Medium Demand to 2030	50 TWh	2029	2037	50 MW, 2036/37
High Demand to 2030	54 TWh	2029	2037	200 MW 2029/30 and 120 MW 2032/33

Source: *The Role of Gas in Electricity and Industry*, Energy Link, April 2023.
243 (energyresources.org.nz)

Concluding remarks

28. We appreciate the opportunity to submit on this Consultation Paper. A market-led approach to pricing and development of new measures and capacity, alongside stable and predictable policy settings, will be New Zealand's best defence against energy shortfalls. We support the development of flexibility options, and long-term capacity contracts to manage the changing nature of our power system, if and when the sector agrees they are needed.

9 https://www.mbie.govt.nz/dmsdocument/5977-electricity-demand-and-generation-scenarios-report-2019-pdf (note this is currently being updated, but at time of writing, the 2019 EDGS is the most recent report.

29. We stress the importance of having policies that are consistent with the new Government's objectives to revitalise the upstream gas market. This will clearly have implications for the Authority. It is really important that there is a joined-up approach across government for policy and operational settings for the energy system that provide for optionality.

30. We encourage the Authority to think broadly about the electricity system and include all fuels and technologies when developing options, particularly as the mix of fuels evolves in our economy. Many in the sector recognise a need for additional fast-start 'peaking' thermal capacity. It is important that policy settings are enabling of it coming to market.