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Transpower

Via e-mail: feedback@transpower.co.nz

Submission on *Te Kanapu* | *A future grid blueprint for Aotearoa*

Introduction

1. Energy Resources Aotearoa is New Zealand's peak energy sector advocacy organisation. We represent participants from across the energy system, providing a strategic sector perspective on energy issues and their adjacent portfolios. We enable constructive collaboration to bring coherence across the energy sector through and beyond New Zealand's journey to net-zero carbon emissions by 2050.
2. This submission relates to Transpower's [consultation](#) on *Te Kanapu* | *A future grid blueprint for Aotearoa* (the 'discussion document'). The rest of our submission has been submitted online using the check boxes provided.

Key messages

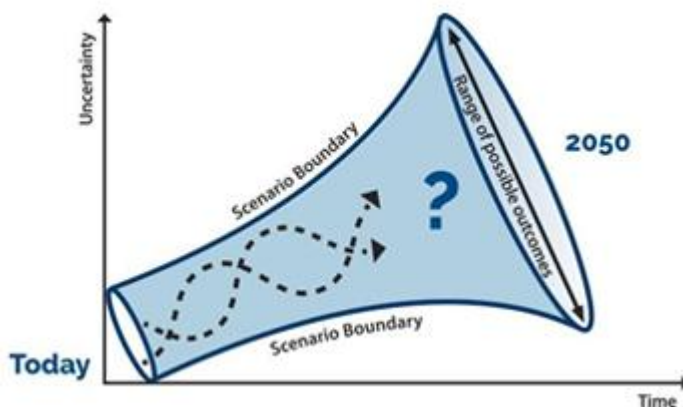
3. Winter 2024 taught New Zealand some important lessons. Hydro, which ordinarily provides over 50 per cent of electricity, reached as low as 42 per cent of generation during the driest weeks. Thermal (coal, and some gas offered back to market) filled that shortfall, underlining the critical role of firming generation in dry years. Stress on the system led to severe price volatility.
4. This underlines the importance for Transpower to base scenarios of the *future grid blueprint* on public benefit principles, such as:
 - a **maintaining energy security through firm, flexible generation** – to support long-term investment in reliable, secure, and affordable energy. For example, Huntly's multi-fuel capability (gas and coal, with potential biomass conversion, or other fuels) is widely accepted as needed for essential flexibility and resilience amid declining domestic gas supply and the growth of intermittent renewables;
 - b **policy and regulatory settings that support investment** – frameworks that incentivise investment in electricity generation assets

capable of ensuring system reliability under uncertain future conditions, especially the firming of renewables; and

- c **building a resilient energy workforce –**
in partnership with the Electricity Engineers' Association (EEA), we are delivering a nationally coordinated energy workforce strategy and action plan that aligns industry, education and government to attract, develop and retain the energy workforce needed to power New Zealand's future.

Scenario planning for a resilient future electricity grid

- 5. Scenario planning is a strategic tool that explores multiple plausible futures, identifying risks, opportunities, and trade-offs to guide robust decision-making. Unlike a single forecast, goal, or "most likely" projection, it develops internally consistent storylines reflecting different combinations of technological, economic, environmental, and social drivers. It is based on evidence and can be adapted to changing circumstances. It asks the 'what if' questions to support system-wide resilience over time.
- 6. For electricity infrastructure, scenario planning enables policymakers, regulators, and operators like Transpower to anticipate change, test resilience, support adaptive policy, and enhance transparency. A set of plausible, coherent and distinct narratives are needed to inform the blueprint, and the critical uncertainties. See, for example, the report from the Business NZ Energy Council in 2015, with figure 8 below from the World Energy Council.¹ This shows there are multiple futures that could realistically eventuate, but the reality will be within the constraints of the scenario boundaries.



- 7. We have already witnessed the destructive nature of setting a singular and unrealistic end goal (e.g., "100% renewable electricity by 2030"). It was hoped such an end goal would provide focus and mobilise action, but it assumed a predictable pathway and stable conditions. In reality, technology, markets, policy, and societal priorities evolve *unpredictably*.

¹ New Zealand Energy Scenarios Navigating energy futures to 2050. [BEC-Report.pdf](#)

8. Scenario planning offers a stronger foundation for long-term strategic policy because it:
 - a tests strategies across multiple plausible futures, ensuring resilience to uncertainty;
 - b encourages adaptable pathways that can be revised as new information emerges;
 - c manages risk by identifying potential lock-ins, stranded assets, and missed opportunities;
 - d builds wider stakeholder buy-in by making assumptions transparent and allowing diverse priorities to be explored; and
 - e creates space for innovation by accommodating emerging technologies and business models.
9. For Transpower, scenario planning can integrate long-term targets, such as net-zero by 2050 *and other important outcomes*, while ensuring strategies are robust in the face of shocks, breakthroughs, or shifts in demand. This approach supports an electricity grid that is not just fit for a single imagined future, but resilient, adaptive, and aligned with broader public policy goals.
10. We are impressed so far with the modelling by Transpower for the annual Security of Supply Assessment (SOSA). We hope that the expertise that feeds into that process is also applied at the strategic, long-term level for this blueprint (also see our section on workforce development and skills, below).
11. The aim is to set clear boundaries for strategic planning, not just show a wide scatter of possible outcomes. The SOSA does this at quite a detailed level, but the high-level blueprint needs to spell out a few likely, realistic, whole-of-system scenarios to guide future decisions. These should not be aligned to any particular policy or bent.

Realistic, reliable evidence

12. Our advocacy focuses on evidence-based, practical public policy. For energy and resources, this means evidence that provides insights about system resilience, firming needs for generation, or investment frameworks that work in our context. Transpower intends to dive into evidence to inform its forecasts for the grid's future demands.
13. The choice of data that underpins the forecasts matters. We think there are sources that Transpower could build upon and expand. For example, according to MBIE's 2024 Electricity Demand and Generation Scenarios (the 'EDGS'), by **2035**, the expected electricity mix could be:

- a 45.7 per cent hydro;
 - b 20.3 per cent wind;
 - c 19.2 per cent geothermal;
 - d 5.6 per cent solar; and
 - e 1.4 per cent other renewables.²
14. This adds to 92.2 per cent, assuming (without mentioning) that roughly a further 8 per cent will be met by thermal fuels (gas and coal predominantly).
15. The EDGS is a useful dataset for inclusion in Transpower's work, but it could do more to be realistic about thermal fuels (including from forestry slash), which are clearly needed well into the future. If they cannot be supplied from domestic sources then, in all likelihood, based on recent winters, they will need to be imported. The work by the Electricity Authority to review past winters should be the backbone evidence for the future blueprint, and updated at least annually.
16. Policy updates should also be incorporated, but not lead the scenarios. The Government recently pledged \$200 million in co-investment for new gas field development. This, paired with the changes to the Crown Minerals Act to reverse the exploration ban and reinstate the Act's promotional intent, need time to take effect and should be incorporated into any scenario planning.

Renewables vs traditional thermal supply

17. Hydro generation dropped significantly during winter 2024, at times contributing as low as 42 per cent of total generation, particularly in mid-August when hydro lake storage was at record lows. During these low-hydro periods with no rain on the horizon, thermal generation (gas, coal, and diesel) had to be ramped up to compensate. Energy spot prices spiked dramatically (up to \$820/MWh) during early August as the system responded to tight supply and rising demand. We also had to rely on our industry, such as Methanex and Tiwai, to offer their contracted gas or electricity back to the market, with implications for their business and our economy.
18. To summarise, thermal output rose sharply when hydro, wind and gas were insufficient. We cannot afford to fantasise about a future grid that does not have thermal input, nor industrial impacts if it is not available.³

² More wind and solar generation needed to meet future demand | Ministry of Business, Innovation & Employment. Found at: <https://www.mbie.govt.nz/assets/electricity-demand-and-generation-scenarios-report-2024.pdf>

³ Review of Winter 2024. ea.govt.nz/documents/7159/Review_of_winter_2024_jnOSQfc.pdf

A reality check is needed

19. We are experiencing a rapid decline in gas production. Coal is the answer to this in the short term (potentially also, imported gas in the form of LNG). Nowhere in these EDGS scenarios is the realism and pragmatism needed to support thermal fuels. Bioenergy is not even mentioned, yet it is a form of renewable *thermal* energy. In many popular evidence bases we observe an ideological aversion to fossil fuels, translating to all thermal fuels, that runs against the actual needs of our energy system. Transpower cannot afford to succumb to this idealism and to be blind to the reality in this future scenario planning.
20. If Transpower is going to make a plausible set of scenarios, it must use reliable and reputable data, and modelling that is not biased or based on implausible goals, such as that of our last government of reaching 100% renewable electricity generation by 2030. This goal is not plausible, even by 2050, or any date for that matter. It is also arguably not a desirable outcome, as it does not allow for the fuel mix needed for energy security. The NZ Battery Project was based on this flawed assumption, and it produced unhelpful results.
21. We urge Transpower not to fall mercy to these failed experiments, but instead, use its leadership role to reset the realistic expectations for the grid in 2050 and beyond. In short, it will require thermals. Hopefully a proportion of this will be from renewable thermals like biomass, but that hope should not blur the very real need for gas and coal to keep our country running and, therefore, feature in Transpower's blueprint without hesitation or apology.

Regulating well for investment in energy infrastructure

22. We have long advocated for a systems-based and fuel agnostic approach to regulating for energy infrastructure. Infrastructure development needs to be done in a way that recognises and acknowledges the interconnectedness and dependencies across the energy system, and the risks associated with taking a reductionist view⁴ of what is a complex system.
23. Problems have recurred with major energy projects, including those for renewable energy such as wind and solar farms. Much of our existing energy infrastructure was built with support from government, including the gas transmission system in the North Island. With New Zealand's relatively small but dispersed population, building and paying for infrastructure to a high standard can be challenging. It is important that our regulatory environment is prepared and allows for long-term planning.
24. The infrastructure pipeline for energy has grown immensely, as illustrated in the discussion document on page 4. This shows 'generation and demand customer

⁴ 'Reductionism' is the practice of analysing and describing a complex phenomenon (in this case the energy market) in terms of its simple or fundamental constituents, especially when this is said to provide a sufficient explanation.

enquiries' increasing roughly 20-fold, from 5 in 2019 to over 100 in 2022 and 2023, with 89 projects (totalling 16,089 MW) having progressed to application, investigation or delivery stages.

25. Demand for electricity may grow (through the energy needs of digitalisation and data centres, for example), but is also a variable input to scenarios, as efficiencies, decentralisation and deindustrialisation could counter demand growth. There is no singular future end point that New Zealand is moving towards. Aside from growth, maintenance and expansion of existing infrastructure, or its decommissioning, must also be considered as part of the pipeline with regulation and standards needing to stay ahead of the curve.
26. Grid capacity is going to be stretched to its limit, continually. The most important consideration is getting more generation into the system to allow for growth. Batteries and reallocation of existing power do not generate electricity.

Building a resilient energy workforce

27. Our partnership with the EEA, Energy Resources Aotearoa to deliver a nationally coordinated energy workforce strategy and action plan builds on our long-standing focus on workforce development and aligns directly with future scenario planning. This initiative will identify workforce gaps and training needs across the energy resources and electricity supply sectors and create clear training and employment pathways to build the skilled workforce essential for our energy sector and strengthening of our economy.
28. By combining robust workforce data with forward looking energy demand and technology scenarios, we can anticipate the skills, training systems and workforce requirements under future pathways. This will ensure our sector is not just responding to change but actively preparing for it to position New Zealand to meet its future energy needs with confidence.

Concluding comments

29. We look forward to working with Transpower and other in the energy sector as this work takes shape. We value collaboration and nowhere or time is that more important than here and now as we collectively think about our future electricity grid and related energy issues.
30. Energy is the lifeline for the economy and our businesses and communities. There are many possible futures and it is vital that Transpower avoids the failed path dependent strategies of the past. We would be happy to contribute to the blueprint in whatever ways are helpful.