Energy Resources Aotearoa
POWERING A BETTER NEW ZEALAND TOGETHER

energyresources.org.nz
energyskills.org.nz
energymix.co.nz
PO Box 25259, Wellington 6140

14 November 2025

Transpower

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

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 2 on future scenarios for a future grid blueprint for Aotearoa, which tests scenarios that will help inform how Transpower needs to invest in the national electricity grid to 2050 and beyond.

Introduction

3. Transpower, as System Operator, has a crucial role in the systemic leadership of the energy system. Scenarios are an important tool in modern systems planning. With foresight, well-informed explorative scenarios can help to set the parameters of plausibility to guide risk management and investment decisions.

4. We last submitted on this work in August 2025. We emphasised the importance for Transpower to base scenarios on public benefit principles, such as:

   a maintaining energy security through firm, flexible generation to support long-term investment; and

   b policy and regulatory settings that support that investment; and

   c building a resilient energy workforce that is nationally coordinated and aligns industry, education and government.

5. Five scenarios have been proposed. Each explores a range of possible futures and varying degrees of electrification, the speed of change and its impacts:

    a Scenario One: **Patchwork nation**;

    b Scenario Two: **Aotearoa electrified**;

    c Scenario Three: **Global green rush**;

    d Scenario Four: **Made in Aotearoa**; and

    e Scenario Five: **Aotearoa intelligence**.

Our thoughts about the scenarios

6. We appreciate Transpower's broader role in planning for New Zealand's future energy system. This needs to be balanced with practical boundaries and limitations that are measurable and evidence-based.

7. Te Kanapu takes an interesting approach by devising scenarios based on the opinions of submitters from consultation one, which has led to scenarios devised from submitters' estimates about technological drivers of the future (e.g., manufacturing, digital services, regional growth, EV uptake).

8. There has been economic modelling involved, but it appears the overarching narratives for the scenarios have been heavily influenced by "what people of Aotearoa see as the key opportunities for future economic growth".[1] The dataset used to create the scenarios is simply a ranking of submitters' (n=93) personal views about economic growth drivers. This is not a robust dataset to underpin national electricity grid planning.

9. This approach will result in biased and ideological scenarios, influenced by normative preferences or narratives. The scenarios in Te Kanapu need to be based on economic rigour, public policy principles and realistic (that is, coherent and plausible) prediction (not forecasting to an end point).

10. Without economic modelling underpinning each scenario, the scenarios cannot reasonably account for price signals and the many factors that contribute to them. Important information like cost trajectories and investment constraints could also be missed.

11. As a result, scenarios will struggle to show whether the futures described are financially or technically feasible, or what trade-offs might emerge between

[1] Discussion document, page 25.

ambition, cost, reliability, and environmental impacts. It is also unclear how distinct the scenarios are, a key factor for good scenario development.

12. Using stakeholder opinions rather than empirical modelling introduces bias, particularly if specific sectors or viewpoints are overrepresented. We believe that the inclusion of two scenarios that represent 'green' ambitions may not reflect the reduced public support for these policies, which has significantly declined due to rising living costs and political uncertainty.

13. Because the drivers are qualitative and perception-based, they are useful for exploring possibilities, but not for policy evaluation. Decision-makers will not be able to confidently use them to test policy resilience or investment pathways.

14. Sector-based drivers from different groups can be inconsistent, and consistency is vital for the energy sector. Overly optimistic assumptions about electrification may produce internally conflicting scenarios and overlook system-wide interactions. The electricity grid is a connected system where generation, demand, storage, and transmission must work together dynamically.

15. Without system or economic modelling, these interdependencies will not be captured, so outcomes may overlook constraints like capacity limits, grid stability, or timing of investments.

16. We fail to see how some new technologies espoused in the discussion document are relevant to the future needs of the electricity grid. We see sustainable aviation fuel (SAF and eSAF) as one such example[2] and shipping fuels (eMethanol) as another.[3] It would be challenging to prioritise scarce electricity for producing green fuels at, what would be, a significant net loss of energy when:

    a SAF will only ever be deployed in international aviation, which is not suitable for electrification due to the travel distances;

    b SAF will probably be imported, or if produced domestically, will use forestry byproduct;

    c synthetic eSAF requires a hydrogen input, possible from natural geothermal byproducts, but otherwise requires vast amounts of electricity to make green hydrogen first; and

    d similarly, green hydrogen will likely never be a viable aviation fuel for Aotearoa.

---

2 Discussion document, pages 25, 30-31.

3 Discussion document, page 32.

17. Transpower must choose whether to design scenarios for:

    a a full energy system (fuels, heat, transport, electricity, industry); or

    b a more grid-centric system (emphasising generation mix, grid investment, demand from data centres, EVs, and regions).

18. While on the topic of demand, it will be important to get clear projections of demand from reliable sources. Currently, there is a wide range of projections. For example, one scenario, **Made in Aotearoa**, projects around 113 TWh of national electricity demand in 2050 (which is a 180 per cent increase on today), while **Patchwork Nation** projects 63 TWh (an increase of 58 per cent on today). Such a chasm between them cannot assist with investment planning.

19. Finally, recent policy decisions by the government have supported a continued role for natural gas in maintaining system stability and encouraging investment in both existing fields and the discovery of new ones. Procurement of LNG is part of this, as it will help sustain demand and infrastructure for gas while exploration continues. Gas must be recognised in scenarios with realistic demand and supply forecasts, as it will be needed beyond 2050. Electrification is not suitable for everything, everywhere.

Recommendations

20. These scenarios fail the test of good explorative scenario development. Using opinion-driven, sectoral scenarios can be valuable for exploring diverse perspectives and stimulating dialogue but they are not a robust basis for strategic planning or investment decisions. This approach risks producing narratives that appeal to hearts and minds but do not hold up under economic or technical scrutiny.

21. For the reasons provided, none of the scenarios are particularly helpful at guiding the investment of New Zealand's electricity grid. The current Te Kanapu scenarios are too *normative* (i.e., based on values, opinions, or preferred futures rather than evidence). Normative thinking leads to predictions, fixed endpoints and path dependence. A better approach would be to design fewer, evidence-driven scenarios that highlight the critical structural uncertainties and real-world trade-offs and ask the 'what if' questions. BusinessNZ Energy Council produced something similar a few years ago, and remains both information and insightful (see here).

22. We recommend:

    a abandoning the five scenarios proposed;

b introducing two evidence-based, not opinion-based, explorative scenarios using quantitative drivers (e.g., demand growth, technology cost curves, policy settings, gas availability, transmission constraints);

c using economic and system modelling to test what is plausible, not just what stakeholders prefer, using only key uncertainties such as pace of electrification and availability of fuels, regardless of why; and

d taking a system level, realistic approach to test scenarios for their resilience in response to the key uncertainties. This should reflect whole of economy, plausible outcomes, not favoured technologies or bets on the future.

Concluding comments

23. We appreciate the hard work that has been dedicated to Te Kanapu so far and see potential in the scenario modelling if our recommendations are applied. As they stand currently, the scenarios reflect too much subjective bias to be useful for grid network planning.

24. If we develop work that cannot withstand 'what-if' questioning, we risk developing work of low inherent value subject to inherent obsolescence when factual circumstances change, reducing their efficacy for investment and other guidance.