



TRANSPOWER

Te Kanapu

The Grid of the Future

Wind Energy Summit 2026



Developing a
future grid
blueprint for
Aotearoa

Te Kanapu – Future Grid

What?

- Long-term planning to guide the development of nationally critical infrastructure

Why?

- Long lead times for transmission build can be a barrier

Outcome

- Evidence base that supports a change to enable grid upgrades ahead of need.
- Improved coordination and collaboration on long-term investments.

The Grid Blueprint will:

- Guide Transpower's least-regrets investments
- Offer insight into managing the future electricity system
- Support others with their long-term planning.

A future grid blueprint for Aotearoa



Our Energy Scenarios

June 2026

Te Kanapu
Future Grid Blueprint

Five different scenarios for 2050

Patchwork Nation	Aotearoa Electrified	Global Green Rush	Made in Aotearoa	Aotearoa Intelligence
				
No clear strategy +42% to 56 TWh	Emissions reduction +69% to 67 TWh	Emissions reduction +111% to 83 TWh	Traditional strengths +146% to 97 TWh	New economy +85% to 73 TWh
In a world of sluggish growth and unclear direction, Aotearoa makes do with what it has.	In a world where global priorities shift with each electoral cycle, NZ chooses a steady, long-term path towards a low-carbon economy.	Global coordination towards reducing emissions accelerates, driving down the cost of clean technologies and improving efficiency worldwide.	A large expansion of goods production across the primary and manufacturing sectors drives growth.	A pivot toward digitalisation and AI where NZ leverages its highly renewable electricity system and low air temperatures for data centres

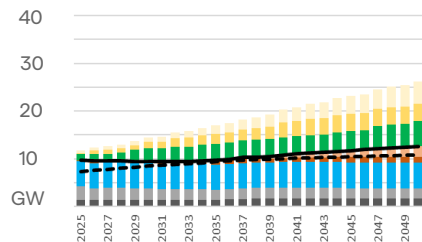
Wind is part of a diverse generation capacity mix

Each scenario needs its own mix of generation that is resource adequate, meaning it can reliably supply:

- Total annual demand (including during periods of low hydro inflows)
- Peak demand

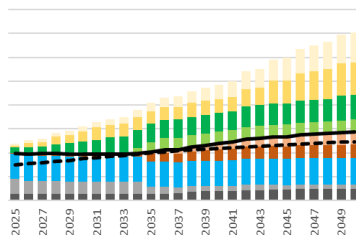


Aotearoa Electrified



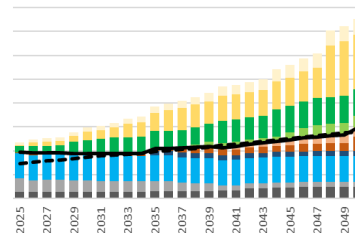
Wind +4.1 GW to 5.3 GW

Global Green Rush



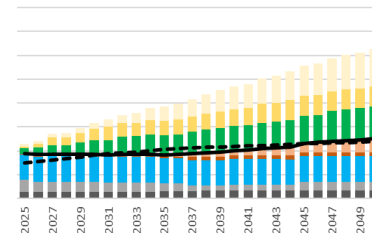
+6.5 GW to 7.7 GW

Made in Aotearoa



+6.9 GW to 8.1 GW

Aotearoa Intelligence



+5.6 GW to 6.8 GW



What you've told us

The opportunity exists but ...

- so do barriers such as regulatory settings, infrastructure and market structure.

Location

- Onshore – new generation where current wind farms are, plus other locations with good access to the grid.
- Offshore - focused on Taranaki, Waikato and Southland.

Size of the prize

- Could increase by 2050 from 2-5GW up-to 10-14GW in an ideal future where constraints are removed.

Potential enablers

- Building public support for renewables
- A bipartisan energy strategy that endures
- Easier planning/consenting regulations to speed up time to market – noting this could be at odds with building public support.
- Creation of renewable energy zones in relevant locations.

How feedback supported our assumptions

Growth in onshore wind generation

- Output grows in every scenario, up to 32% of generation mix in Global Green Rush

Offshore wind a feature

- Global Green Rush and Made in Aotearoa assume 2.5 GW offshore by 2050

Identification of regional opportunities

- Wind generation features strongly in some regions with a significant role in future economic growth



Insights paper

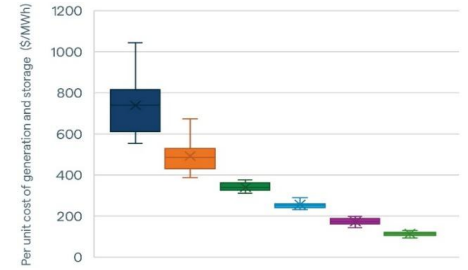
Fuelling growth by enabling a diverse mix of generation

June 2026

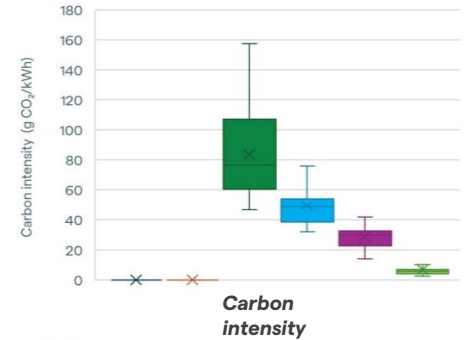


Role of networks

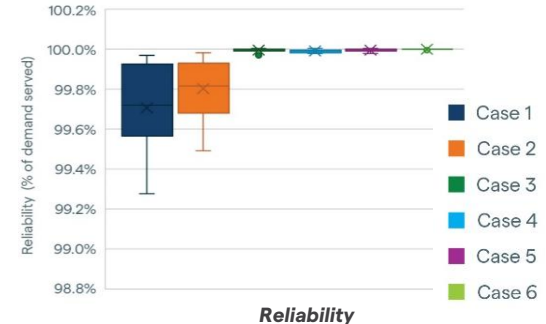
- Six generation mixes to meet future demand.
- Case 1: local roof top solar and batteries only
- Cases 2-6: progressively introduce more generation types.
- Diversity is key!
 - significantly reduces the cost of the new generation and storage.
 - highlights the enabling role of networks.
- Our Grid Blueprint will calculate network costs and optimise these with different generation mixes across our scenarios
- Answering the question: **what combination gives the overall least system cost?**



Per-unit cost of generation and storage



Carbon intensity



Reliability

A nationwide mix of wind, solar and batteries combined with geothermal, thermal, and our existing hydro fleet balances the energy trilemma and produces a strong outcome for NZ Inc

Case 1



1. Local rooftop solar
2. Batteries

Case 3



1. Local rooftop solar
2. Batteries
3. Local utility-scale wind
4. Thermal peakers

Case 5



1. Local rooftop solar
2. Batteries
3. Local utility-scale wind
4. Thermal peakers
5. Geothermal
6. Hydro

Case 2



1. Local rooftop solar
2. Batteries
3. Local utility-scale wind

Case 4



1. Local rooftop solar
2. Batteries
3. Local utility-scale wind
4. Thermal peakers
5. Geothermal

Case 6



1. Nationwide distributed solar
2. Batteries
3. Nationwide utility-scale wind
4. Thermal peakers
5. Geothermal
6. Hydro

Increasing enabling role for electricity networks



Affordability



Sustainability



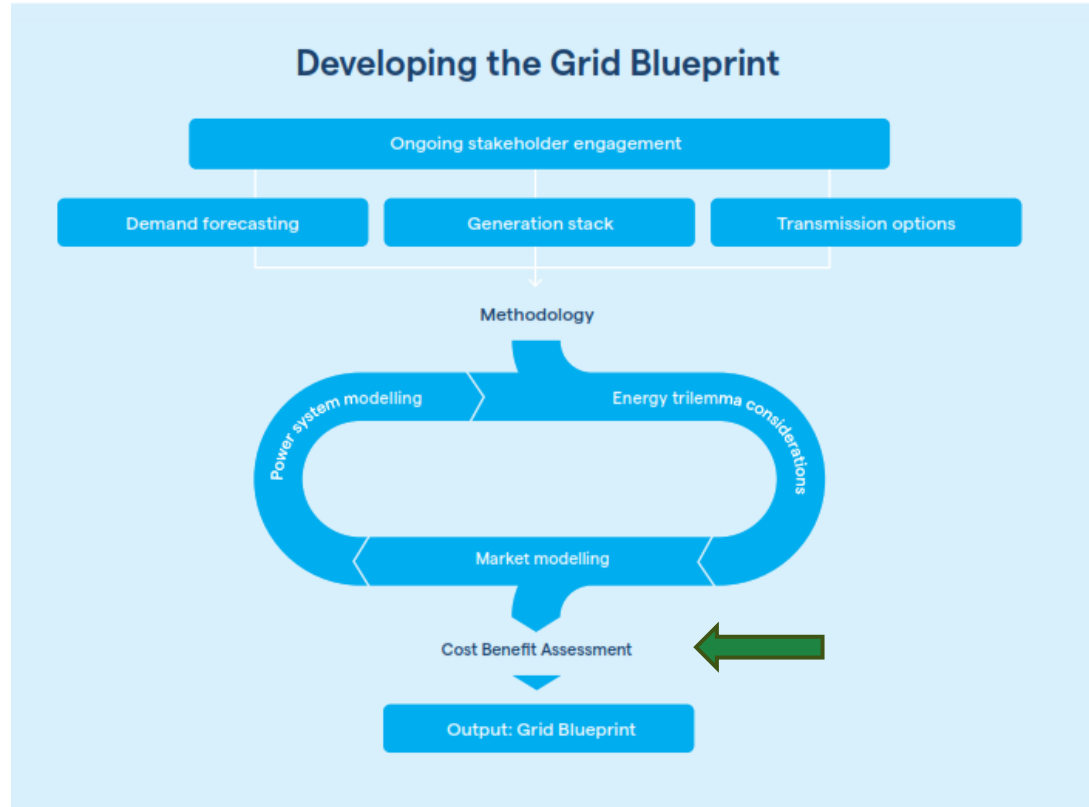
Reliability

Where are we at today

- Scenarios, generation stack, transmission options and stakeholder feedback are all **inputs** into the creation of **network development plans**

Network development plans

- Power system, reliability, resilience and market modelling **complete**
- Competition benefits and cost benefit assessment now **underway**



Early indications – transmission investment stacks up

The economic case stacks up

Early analysis shows new transmission is likely to pay off in all scenarios

- We've considered the benefits of adding transmission capacity within each island
- how this might enable regional opportunities and connect new resources
- Also issues like resilience through how the grid is configured

This will inform our least regrets investments for the 2030s and 2040s

The benefits

- Unlocks lower-cost renewable generation from the best regional resources
- Reduces the total system cost of delivered electricity
- Supports electrification of industry and economic growth
- Improves resilience, security of supply and reliability
- Cuts dependence on imported fuels

Our timeline to develop the grid blueprint

1	2	3	4	5	6
Imagining Aotearoa in 2050	Potential scenarios	Technical approach	Future direction	Insights and engagement	Draft grid blueprint
July 2025	October 2025	December 2025	March 2026	June 2026	Early 2027
Gathering views on the future of Aotearoa in 2050	Draft scenarios, load & generation	Draft methodology, potential investment options	Finalised scenarios, generation mix	Release of insights papers, ongoing engagement	We'll publish our draft grid blueprint
