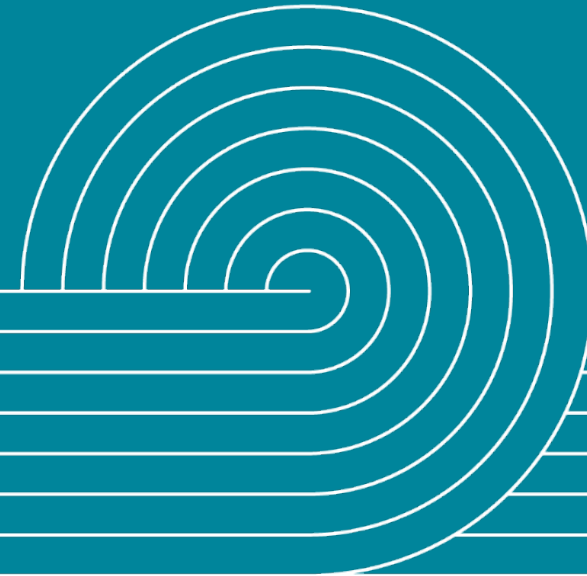




# Enabling New Zealand's Energy Future



Alison Andrew, Chief Executive 13.02.2020

# Agenda

## **1. Introduction: Electricity's role in a Net Zero Carbon future**

- 2. Te Mauri Hiko: Demand, Supply, Emissions, Affordability
- 3. Te Mauri Hiko: Implications for Transpower and business

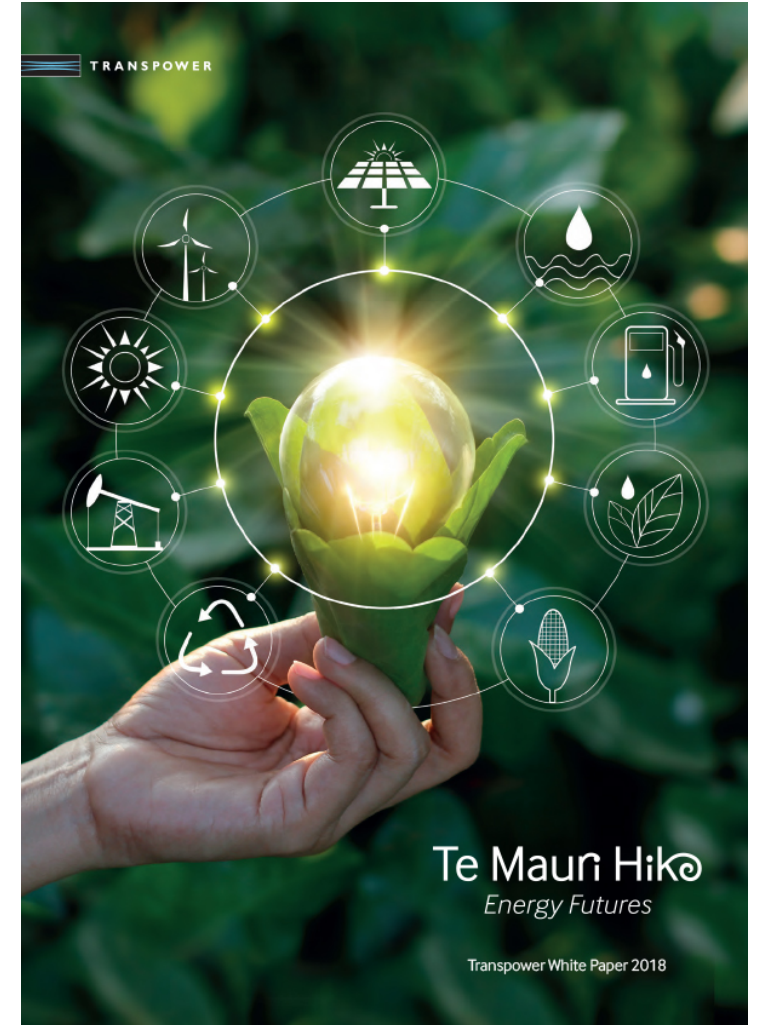
# Transpower: Enabling NZ's transition to net zero carbon

- The Climate Change Response (Zero Carbon) Amendment Act passed November 2019
- Committed New Zealand to reduce its greenhouse gas emissions to net zero by 2050
- Electrification and renewable generation identified as significant sources of emissions reductions
- Transpower's role is to enable the transition



# Reaching net zero: The role of electrification

- New Zealand's electricity system is unique globally and has many advantages
- Electrification of transport/process heat will drive decarbonisation
- Renewables will increasingly dominate
- A renewable future is the most affordable
- Achieving this will require a lot of new infrastructure
- Policy and regulation must be integrated, effective, timely and targeted
- A number of challenges need to be solved by business and government



# Agenda

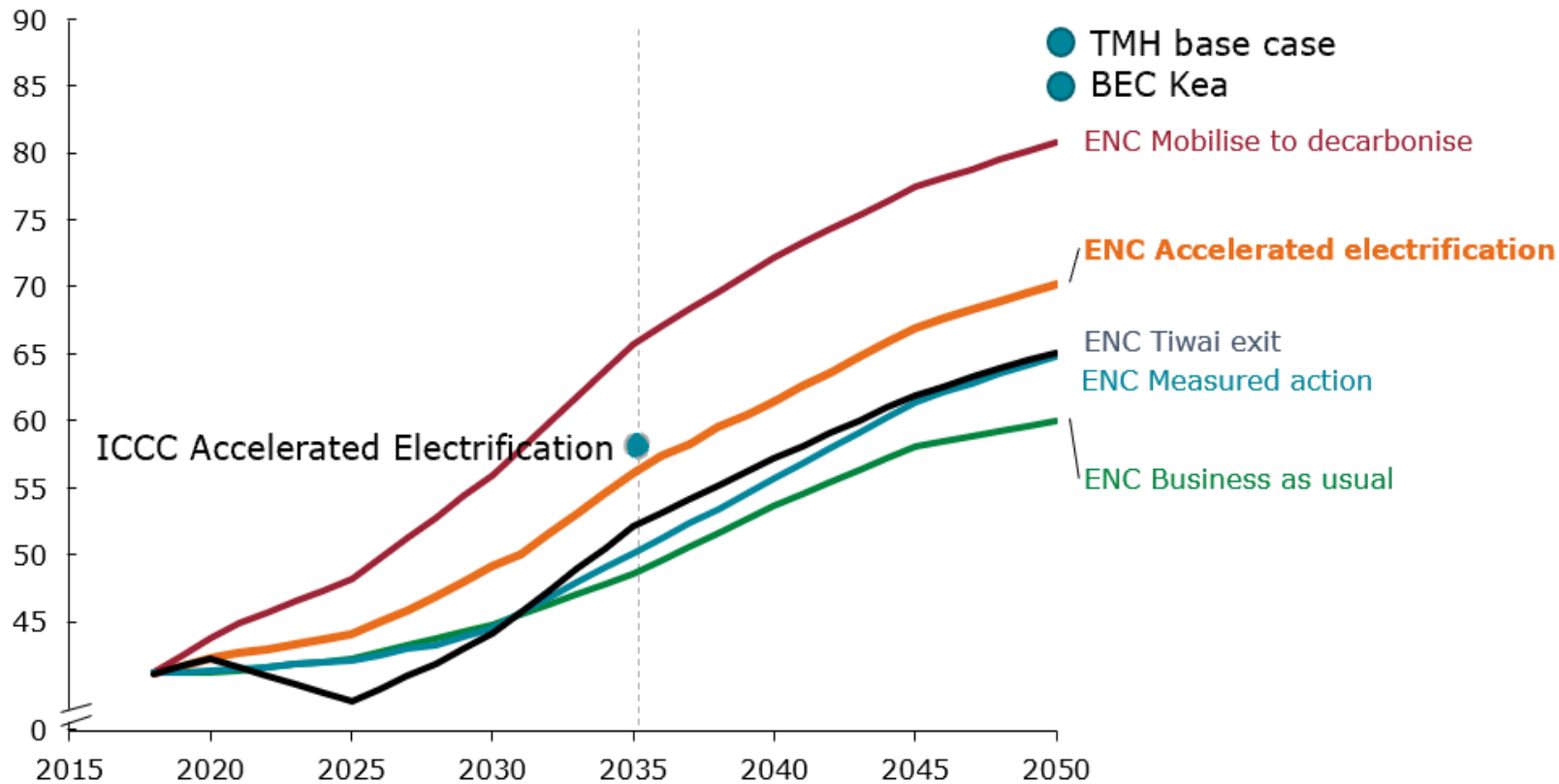
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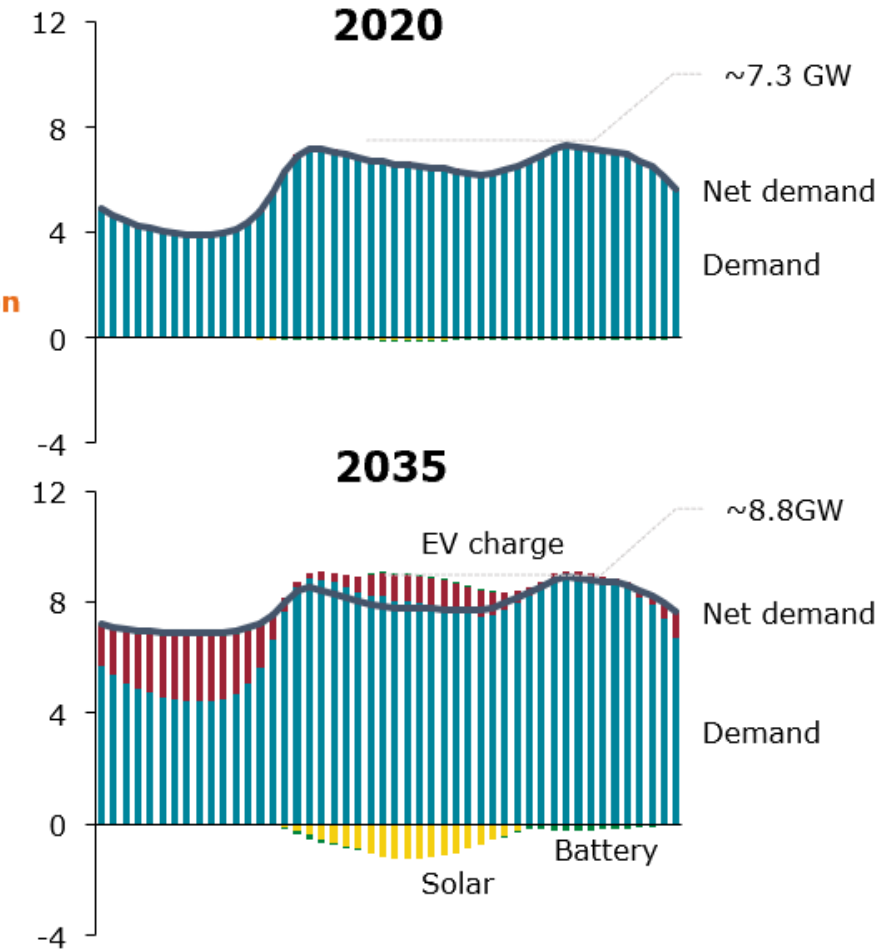
3. Te Mauri Hiko: Implications for Transpower and business

# Electrification of transport & process heat forecast to increase electricity demand by 30% between 2020-2035

**Gross demand estimates**  
(TWh)

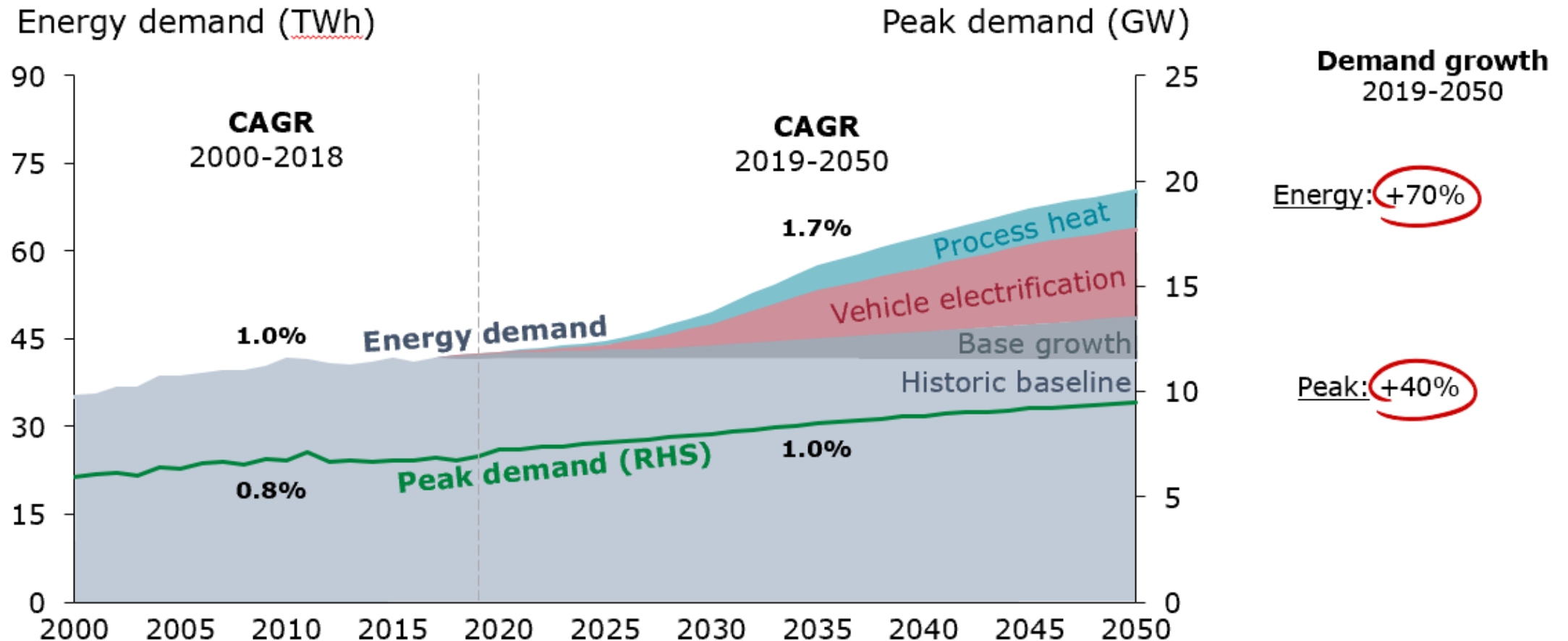


**Winter daily peak profile**  
(GW, Accelerated electrification)



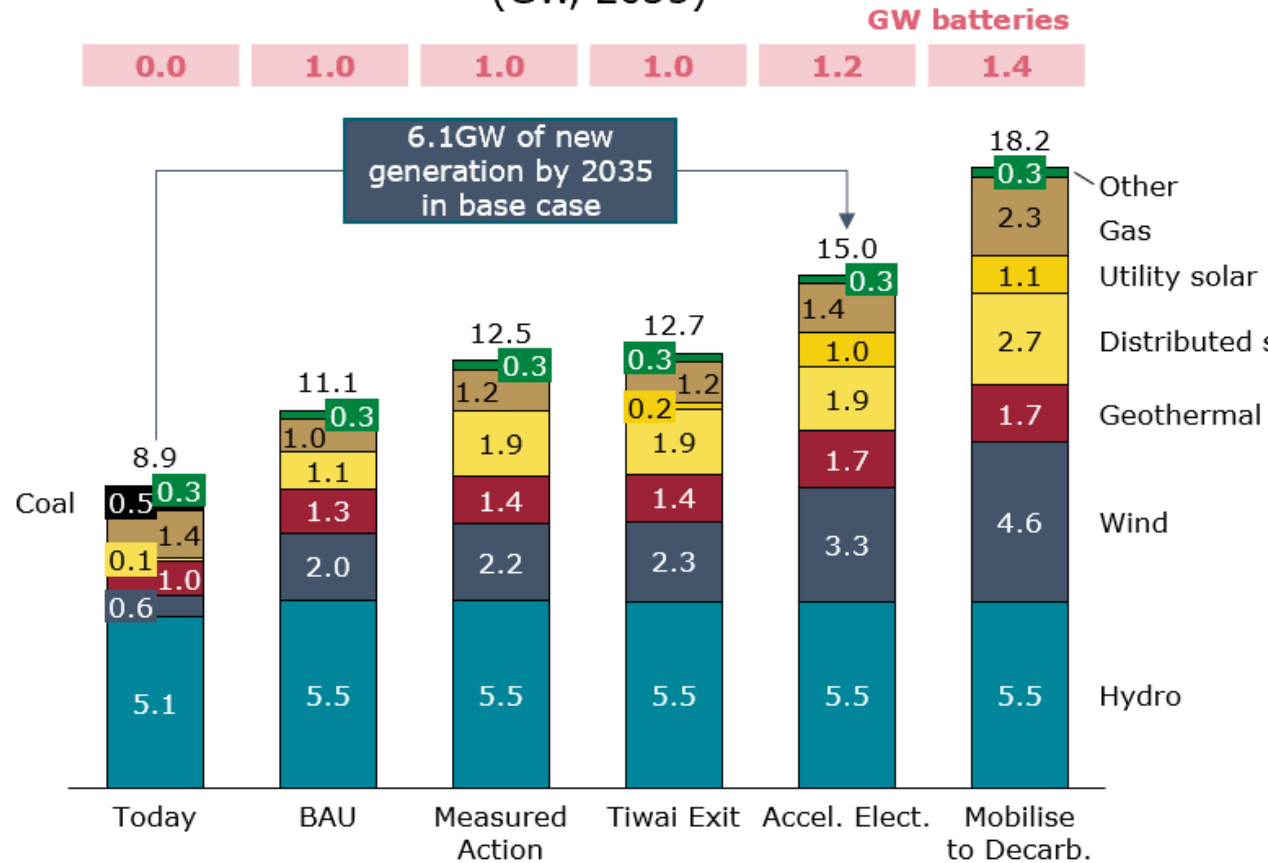
# By 2050: Energy demand forecast to grow by ~70% - peak demand grows ~40% due to 'smartness of demand'

## Energy and peak demand (Accelerated Electrification)

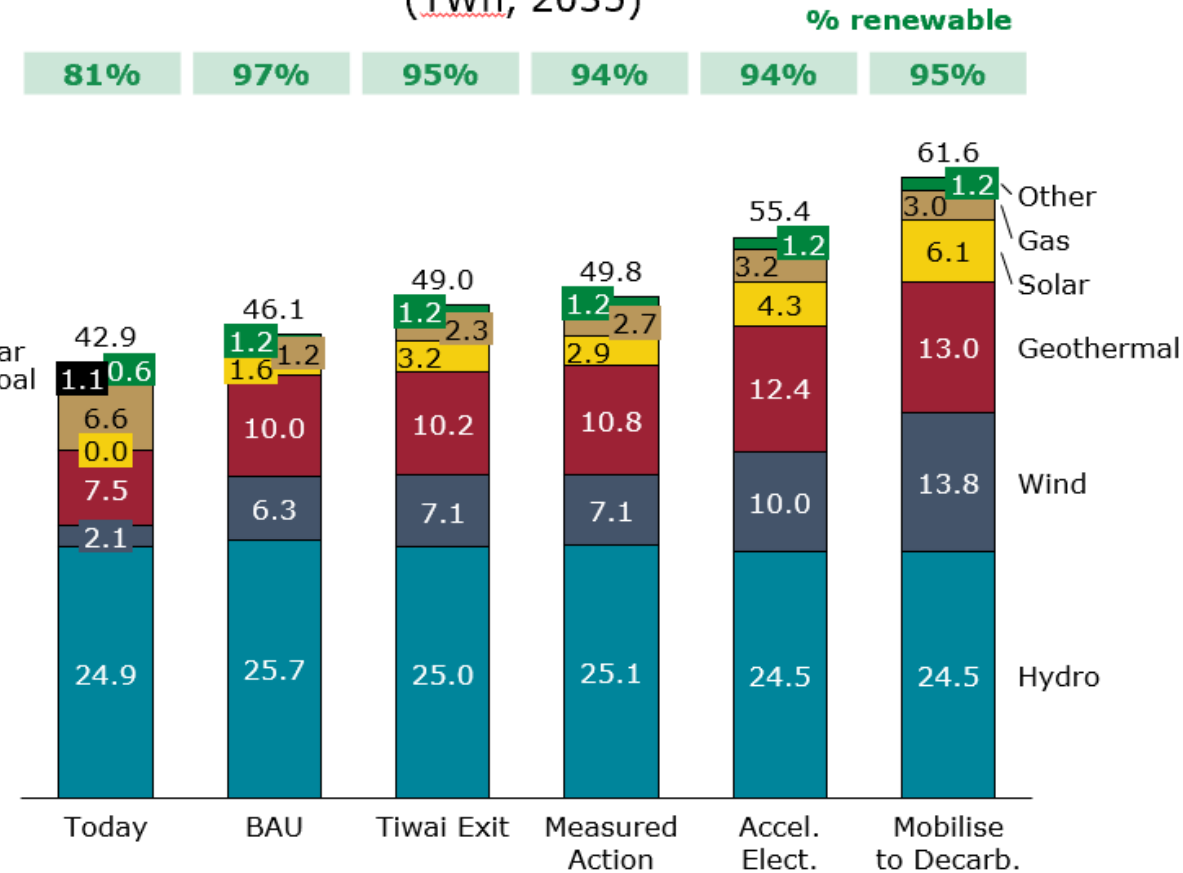


# By 2035: 94-97% of generation is renewable, with gas, batteries and hydro storage providing intermittent generation

**Capacity mix by pathway**  
(GW, 2035)



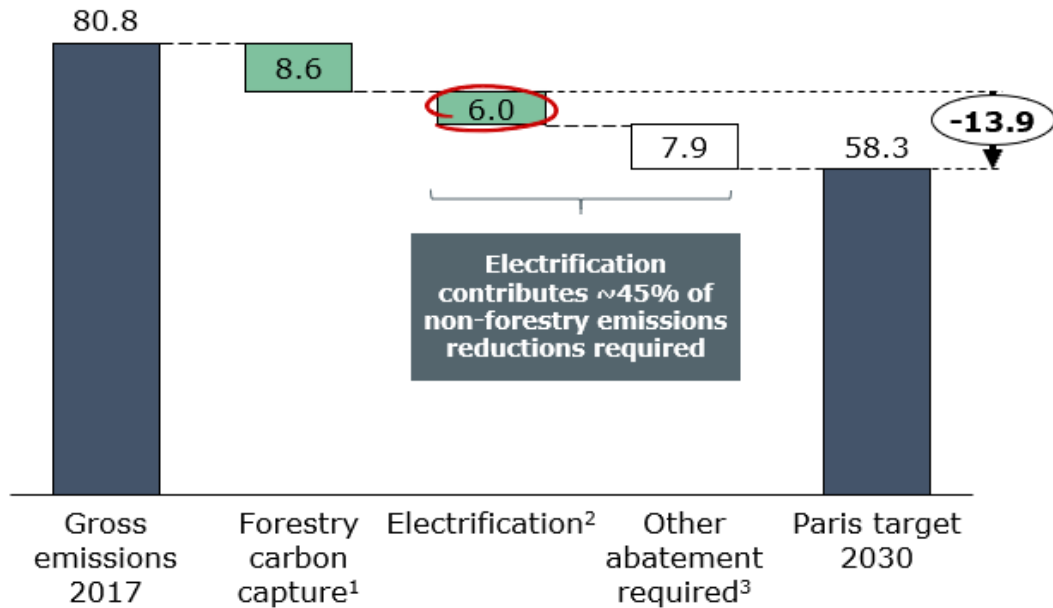
**Annual energy mix**  
(TWh, 2035)



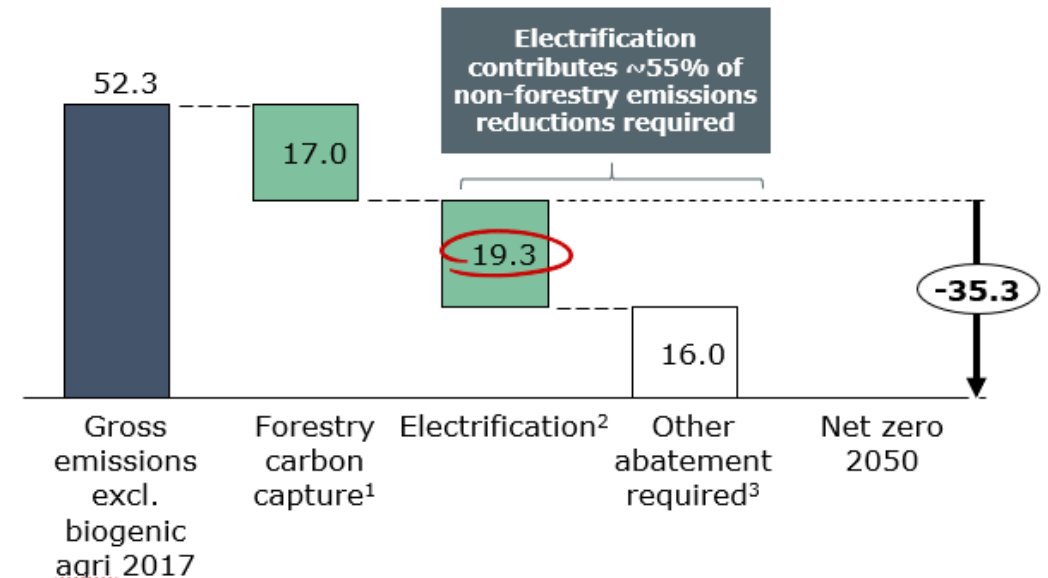
# Electrification provides material emissions reductions towards meeting New Zealand's 2030 and 2050 emissions targets

## Contribution to emissions targets (MT CO<sub>2</sub>e)

### Paris Agreement target (2030)

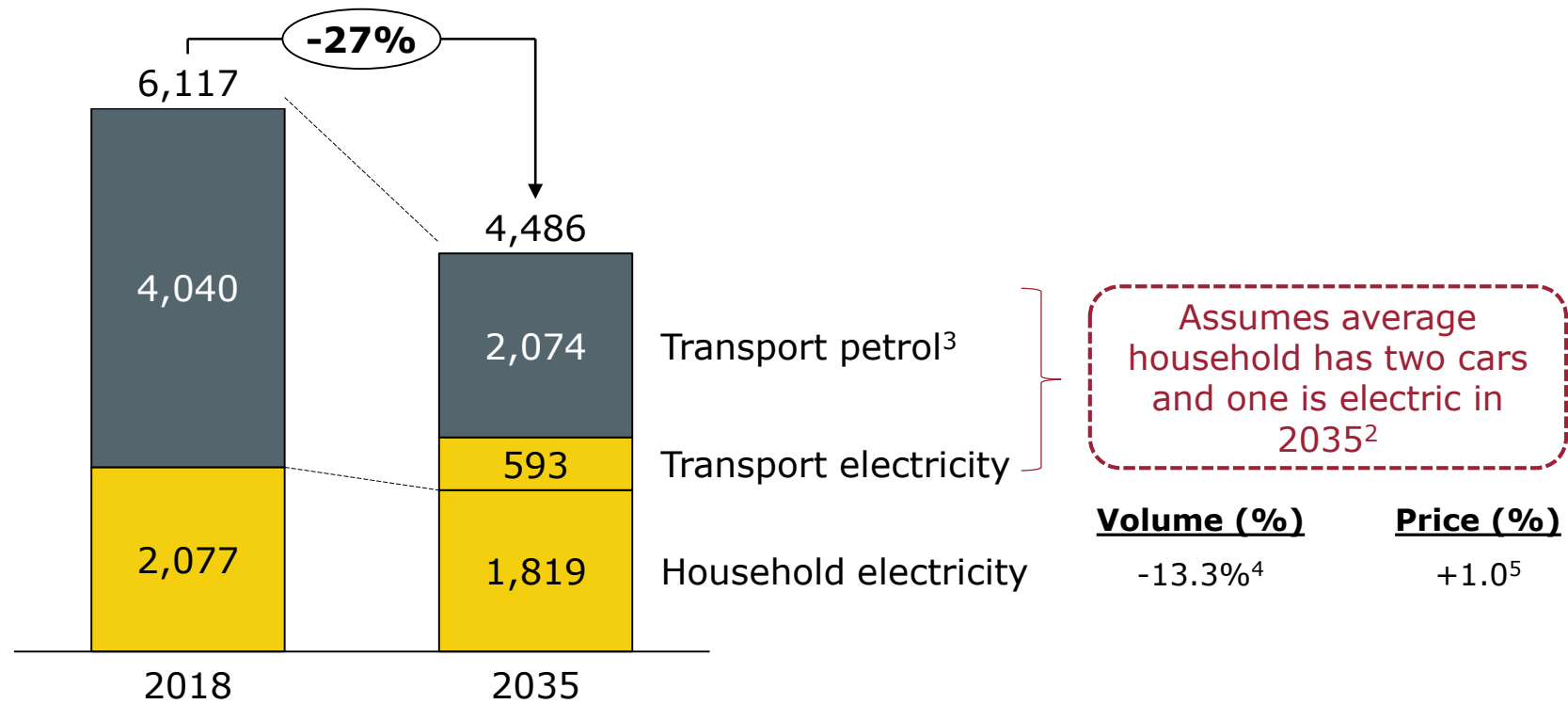


### Zero Carbon target (2050)



# By 2035: Electrification of household transport & efficiency gains reduce average household energy bill by ~25%

## Estimated average annual household energy costs<sup>1</sup> (\$2018, real)



# Agenda

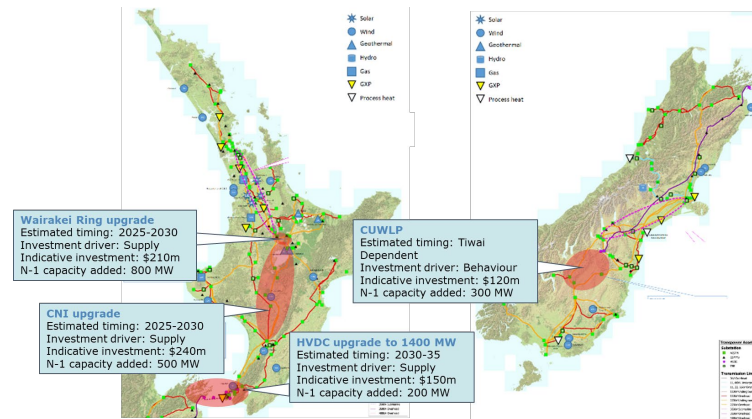
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# Transpower: enabling a renewable energy future through grid planning, new connections and focusing on the workforce

Planning for a Grid that enables a net zero future

Improving our connections process and information provision

Developing the capability and capacity of our workforce



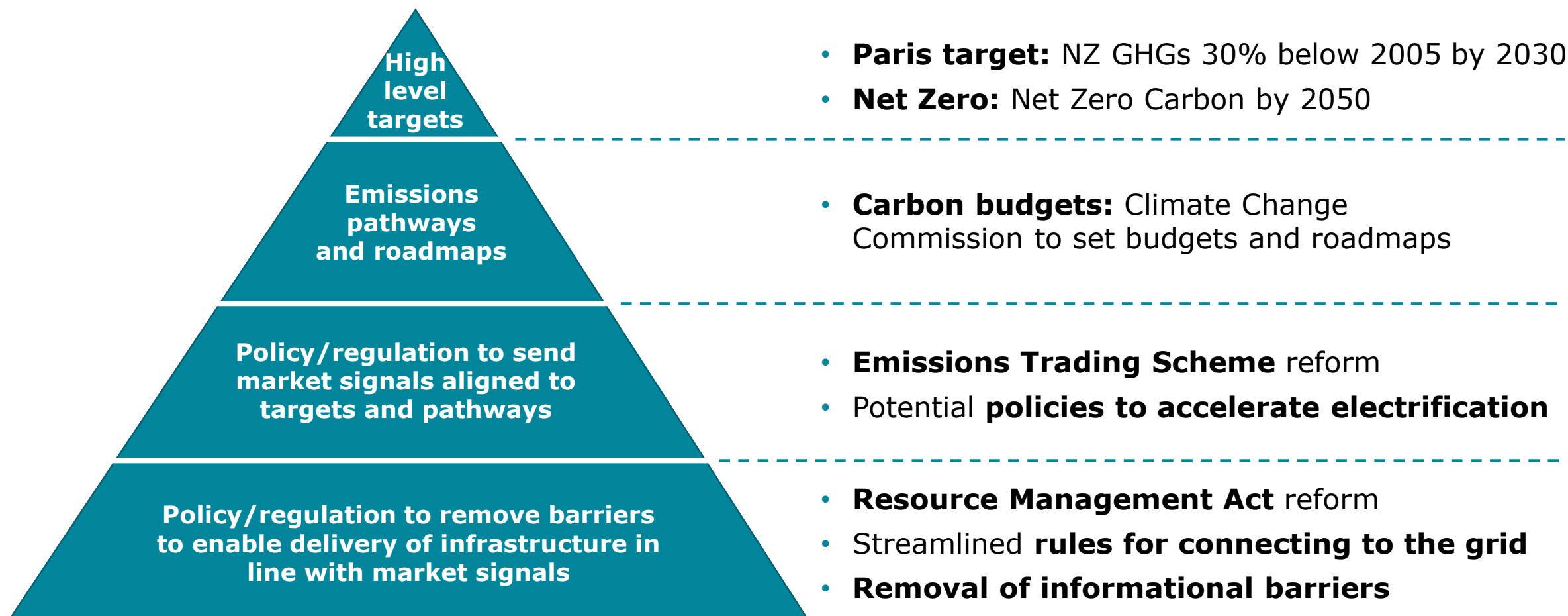
Existing Process

Future process

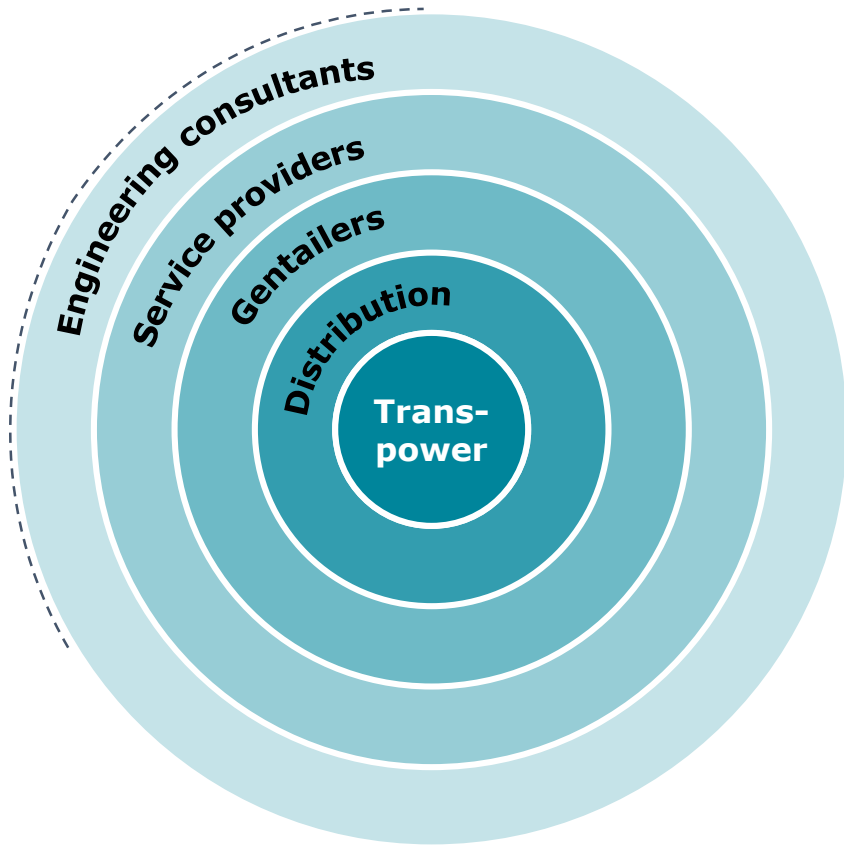
Cycle time



# Policy and regulation: need to send the right market signals



# Workforce: significant increase in capability and capacity



## **Transpower:**

- forecast to deliver ~70 new connections and 10-20 new interconnections by 2035

## **Distribution companies:**

- integrate electric vehicles and electrified process heat into their networks

## **Generation companies:**

- forecast to need to develop ~40 new large-scale generation projects by 2035

## **Service provider demand**

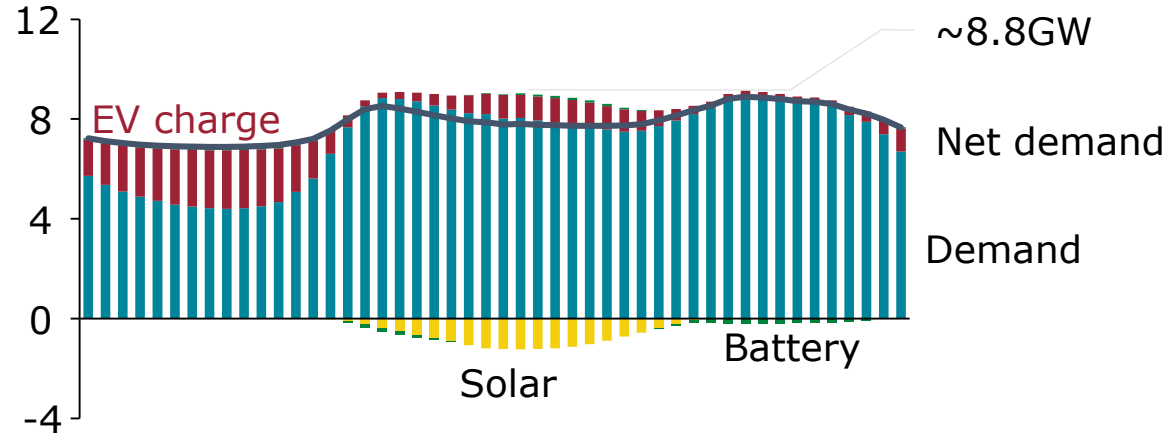
- expected to increase

## **Demand for engineering consultants**

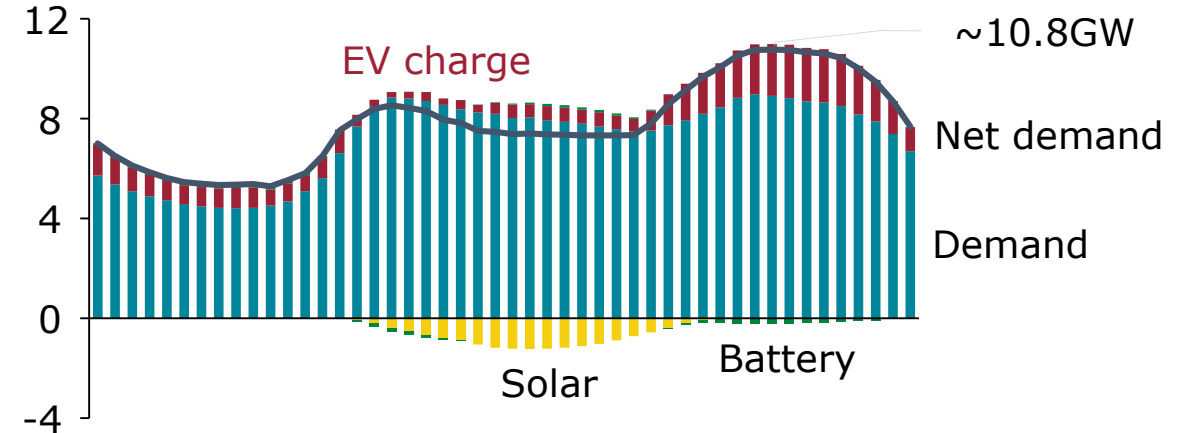
- expected to grow

# Managing peaks: role for policy and markets

**2035 peak profile with smart EV charging and TOU pricing**



**Illustrative: 2035 peak profile without smart EV charging and TOU pricing**

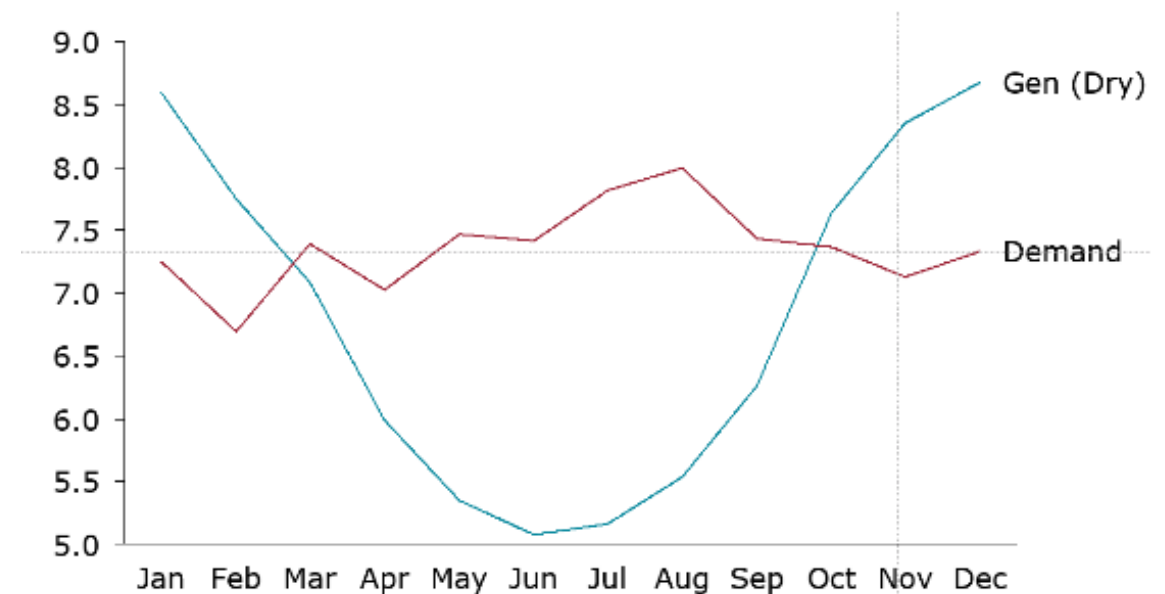


**Inability to manage EV charging could add up to 2GW to peak demand in 2035**

# Meeting peaks and dry year with more intermittent generation

- High reliance on hydro generation yet 6 weeks storage only
- With an increase in renewables and thermal plant exits the challenge increases
- Technology options exist: gas with carbon capture and storage; biomass; large-scale demand response; pumped hydro energy storage; or a further development in long-term storage
- Energy efficiency, demand response and batteries will support the management of peaks
- Will market signals drive the investment required?

**Monthly supply and demand estimates for dry year**  
(TWh, 2050)



# Te Mauri Hiko: powering our energy future

- Decarbonising our economy means electrifying it which will deliver affordable, sustainable and reliable energy.
- In March, Transpower will release its next discussion document aimed at mobilising everyone to face this future.
- It's time to start taking tangible steps to drive the change required.
- Transpower is the enabler at the heart of the sector
- We all need to work together



A person is ziplining over a dense, green forest. The sun is shining from the upper left, creating a warm, golden glow and lens flare across the scene. Several thin, parallel lines representing the zipline cables stretch diagonally across the frame. The person, wearing a red jacket and a yellow helmet, is suspended on the right side of the image. The text "THANK YOU" is overlaid in large, white, sans-serif capital letters in the center of the image.

THANK YOU