Our climate scenarios

Powerco has developed four challenging and unique scenarios, specific to the Powerco gas and electricity networks. They are centred on how New Zealand and the global transition to a net-zero carbon future (or lack of) will plausibly affect us over the short (2035), medium (2050) and long term (2080). Previous scenarios have been developed by both the energy sector and Powerco. This project has utilised and leveraged this previous work and aligned scenarios where appropriate¹. These existing scenarios helped provide useful context and identify relevant drivers for the scenarios. During 2024, we have participated in the recent development of the New Zealand Energy Sector Scenarios and will utilised this work to determine any emerging risks and opportunities not previously considered.

Our scenarios describe the driving forces of climate change, building high-level assumptions about each of the plausible worlds. Policy ambition (either coordinated or delayed, global or local) are relevant to Powerco and, therefore, are seen as foundational to the scenario development. The warming scenarios include several representative concentration pathways adopted from the Intergovernmental Panel on Climate Change (IPCC) and consider a range of possible greenhouse gas (GHG) concentration trajectories. These are also aligned with the Socio-economic Shared Pathways (SSPs) of the recent IPCC AR6 report. In addition to the three Climate Standards mandated scenarios, Powerco has also elected to include a fourth scenario, New Zealand Greenhaven, which allows for a future where Powerco would need to consider both network resilience and decarbonisation aligned with a planned approach focused largely on electrification.

The time horizons in which climate-related risks and opportunities are identified are integrated into our strategic planning processes. The shortterm time horizon (2035) captures part of our asset management planning period (10 years) and a variety of transitional risks and opportunities. The mediumterm planning horizon (2050) aligns with New Zealand and international emissions targets. The long-term planning horizon (2080) accounts for the lifecycle of our network assets and variety of physical risks that we may encounter when we replace these assets

Global Alignment

The globe and New Zealand pursue aggressive emissions reductions, and this succeeds in limiting global temperature increases to 1.5°C (above pre-industrial temperatures), with global net-zero emissions being achieved by 2050. The transition occurs in a coordinated manner across government and the energy sector, with clearly signalled policy changes.

1.5°C policy ambition RCP 2.6 (0.9-2.3°C by end of century)

Lower increase in severe weather events

signalled and smooth

Policy change is clearly

Hothouse

Global emissions continue to grow unabated largely due to a failure (reversal) of key emissions reduction policies both in New Zealand and in key developed, high-emitting countries. This leads to warming levels that reach 2°C by 2050, and continue to increase steeply thereafter, reaching 4°C by end of century. Climate 'chaos' enters mainstream discourse, across all sectors and communities.

No ambition

RCP 8.5 (3.2-5.4°C by end of century) Extreme increase in severe weather events

Global Delay

The globe and New Zealand are delayed in their transition, resulting in a steady increase in temperature between 2020-2030. The New Zealand energy sector direction is unclear, and decisions are protracted. Realisation occurs in 2030 that action is urgently needed. However, this results in abrupt and poorly coordinated policy and market changes.



2°C policy ambition



RCP 4.5 (1.7-3.2°C by end of century)



Moderate increase in severe Policy change is delayed and chaotic weather events

New Zealand Greenhaven

New Zealand and most of the developed world continue to pursue net-zero targets by 2050. However, the rest of the developing world do not follow suit, leading to a rise in global temperatures between 2-3°C by end of century. New Zealand is viewed as a 'greenhaven' by many in the world and attracts investment and immigration as a result.





RCP 4.5 (1.7-3.2°C by end of century)

Moderate increase in severe weather events

Gas supply and demand study, (EY, 2023); Energy Sector Climate Change Scenarios (The Aotearoa Circle, 2024)





No new policies, possible reversal

Policy change is indicated and smooth for New Zealand

¹ Electricity Networks Association (ENA) – Network Transformation Roadmap, 2019; The Future is Electric (Boston Consulting Group, 2022); Whakamana i Te Mauri Hiko (Transpower, 2020); Gas Infrastructure Futures in a Net Zero New Zealand (Vivid Economics, 2018); Gas Industry Company,

Scenario development methodology

The Powerco scenario development process was completed in FY23 and was led by external climate specialists, along with 22 key stakeholders from Powerco's management team. These stakeholders were crucial for both the development and successful utilisation of the scenarios. The methodology for the scenario development process is included.

Step	Detail
1	Key stakeholders from Powerco management team were selected.
2	A focal question was developed/agreed to hold focus through the scenario development process.
3	Time horizons were agreed.
4	The scenario archetypes were agreed, which included two Aotearoa Climate Standards XRB mandated scenarios (1.5°C aligned, and >3°C), and at least one other. A fourth scenario was developed that allowed for a future where Powerco could consider both network resilience and decarbonisation. The scenarios consider both local and global policy impact and subsequent warming pathway.
5	Driving forces were identified. Identification of driving forces helped us explore and develop an understanding of how the physical and transitional risks and opportunities of climate change might plausibly impact our network assets and business operations over time.
6	 Driving forces are external factors, outside the control of Powerco, which may have an impact on our organisation. A method to identify these drivers is called STEEP, which groups drivers into five categories – social, technology, economic, environment and political. Physical risks are those categorised as environmental and can be acute or chronic. Opportunities also exist and are grouped into five categories – resource efficiency, energy source, products and services, markets, and resilience.
7	The identified drivers were ranked based on their level of uncertainty and impact to Powerco. Those with moderate-low levels of impact were documented and 'left out', and high-impact drivers were retained. Those with high uncertainty were those where very little was known about their future state and should be considered as being foundational to the archetypes. This exercise was completed in a qualitative manner for this project.
8	Outcomes and pathways were generated for top-ranked drivers. Stakeholders explored the different outcomes (and relevant pathways) related to each shortlisted driver under each of the agreed scenario archetypes.
9	Following review of all the drivers and outcomes, narratives were developed. These outcome pathways are descriptions of how the driver manifests within each of the scenarios.
10	Quality check and review. The narratives were reviewed, updated, and approved by both Powerco's Executive Leadership Team and the Powerco Board.

The shortlisted drivers are listed below:

Social: Customer behaviour in energy needs (active of	
passive), population shifts (urban/rural/local).	
Technology: Uptake in renewables (Powerco distribution).	
Economy: Supply chain impacts (includes technical	
resources and skills sets), Access to finance and insurance,	
Infrastructure interdependencies.	
Environmental - Severe weather events, sea level rise, and	
managed retreat.	
Political: Regulatory changes, Phase out of internal	
combustion engine vehicles, and transition to electric	
vehicles, future of agriculture.	

We have used scenario analysis to identify and evaluate our material climate-related risks and opportunities using the following methods:

- Shortlisted drivers are evaluated and prioritised in a qualitative manner in terms of their impact, climate-related velocities, current management response or proposed future mitigation.
- The risk assessment outcomes are aggregated to give a high-level indication of the relative importance of the • climate-related scenario.
- The outcomes are further evaluated and integrated into our risk management framework the same manner as any other risk at Powerco.



Resource efficiency –

Energy Source – Growth of electricity distribution and services, Biomethane * included as climate driver. **Products and services** - Products and services that

support a low emission cost effective electricity network. Markets -

Resilience - Investment of additional resilience spend * included as climate driver.