



Major Electricity  
Users' Group

Promoting  
a robust  
electricity  
market

# Case study:

TRANSPower



## The Grid Owner and Operator: Transpower

Transpower provides the system operator function to the market, ensuring there is enough supply to meet demand in every moment of every day.

When the system operator has visibility of a looming capacity shortfall, as it did on 10 May this year, as part of its market coordinating role it may ask large industrial customers connected directly to the electricity transmission grid to reduce their electricity use to help the sector through the tight spot.

It will also work with local lines companies to switch off controllable load such as hot water ripple control, and on rare occasions it may ask other businesses and households to be mindful of their electricity use during peak demand periods to reduce demand on the system and mitigate the risk of power cuts.

Industry and regular Kiwis working together to switch off electricity they don't need to use pushes out the need for the system operator to instruct load shedding in real-time if there is a shortage of supply to avoid worse outcomes for consumers including potential cascade failure of the power system.

Consumers' demand response over longer periods can also help the industry to respond to energy shortages, including when hydro storage levels are low. This can help avoid the need for an official conservation campaign, which requires electricity retailers to compensate customers \$12 per week. Being smart about electricity use now could help the power system get through until the rain comes.

Although the industry works well together to make these potential electricity shortfalls extremely rare, Transpower is eager to see more market participation from the demand side.<sup>1</sup> It's smart for electricity users and its smart for the power system as a whole. Growth in demand side participation was an expected feature of New Zealand's market design, including to provide cost-effective capacity when needed, and to better support competitive downward pressure on prices for consumers. Relative to other jurisdictions, such as Texas and Australia where payments incentivise demand to respond, it has taken a long time to develop.

California is another example where the system operator sees overseas demand response being driven by residential consumers. The Californian grid operator (CAISO) utilises government subsidies to compensate consumers for taking load off during grid emergencies.

<sup>1</sup> TP\_Sub\_Solutions\_for\_peak\_capacity\_issues\_1March2024.pdf (transpower.co.nz)



## How could this work in practice?

Bilateral demand response agreements between large users and generators, each of which is unique, can help the system operator to understand how large loads will respond to capacity shortfall or energy shortage risks to the power system.<sup>2</sup> This visibility helps the system operator to better forecast and assess risks ahead of time, and manage them into and through real-time.

Large users can participate directly in the wholesale market using the dispatchable demand product. However, Transpower acknowledges the requirement to respond to a system operator instruction to dispatch load off within five minutes can be unworkable for industrial companies like Oji, Fonterra and Rio Tinto. While other large users, like supermarkets and cool stores, may be able to respond this quickly, the setup cost and practical overhead of participating in dispatchable demand is a disincentive.

Transpower also sees the potential for consumer energy resources (CER) owned by smaller users across the country to provide flexible capacity when the system needs it most. Mostly this capacity is contracted to retailers. Tariffs that incentivise CER response are an emerging feature of our market, as are virtual power plant aggregator offerings by other parties. Currently, the system operator does not have good visibility of this type of demand response except via pilots and trials including AraAke's Winter Peak Innovation Pilot. As this CER response builds across the power system, mitigating risks will make it more important to improve visibility to the system operator, including understanding how much response to expect at each connection to the national electricity grid.

<sup>2</sup> The capacity (or peak demand) shortfall risk is having enough capacity available to respond reliably and quickly when demand across the motu peaks, which typically occurs on a cold, still and dark winter's morning or evening (measured in kW or MW) but may also happen during unseasonable cold snaps in spring and autumn. The energy shortage risk is having enough energy to supply consumers over the winter months when fuel from rainfall, the wind and the sun are typically in shorter supply (typically measured in kWh or MWh).

## Where is the system going next?

Transpower notes that financially incentivised demand response is only available through bilateral and tariff-based retail contracts at present. Whether a more direct market payment for demand to respond is needed, efficient and competitive is a market design question for the Electricity Authority.

This is different to several overseas jurisdictions, where grid operators and regulators do pay compensation where load is taken off and where forecast reliability and security are outside a relevant standard. The Australian Energy Market Operator operates the Reliability and Emergency Reserve Trader (RERT) which can make payments to large users appointed to panels offering short, medium, and long notice periods to reduce demand.

On 10 May 2024, when the system operator was facing a shortage of generation, the nation reduced demand by a not inconsiderable 200MW. However, while this response was carefully planned and coordinated, it relied on the goodwill of a range of industrial users and Kiwis at home and at work. To develop demand response more fully for these type of situations will require real incentives to be put in place.

