Demand response new zealand

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Most of New Zealand"s electricity (around 80-85%) comes from renewable generation. One of the challenges of renewable electricity supply is that some sources are "intermittent". For example, solar and wind energy are not continuously available, but fluctuate depending on time of day and weather conditions. New Zealand relies on hydro as a baseload source of energy, but even hydro supply can vary during times of low rainfall or "dry years".

At "peak" times, and/or when there is not enough renewable electricity supply to meet demand, the gap is filled by increasing fossil fuel generation. In New Zealand, electricity use peaks in the mornings and early evening, when residential use of heating and appliances is highest. Peaks are higher in winter due to increased heating demand.

As we move more of our energy usage to electricity (for example, as more people buy electric cars, and industry transitions from coal), it will be increasingly important to ensure we aren"t using electricity unnecessarily during peak periods.

Building more electricity infrastructure to meet peak demand is expensive, and ultimately increases the cost of power for all consumers. Using smart devices to manage demand peaks, and therefore reduce our infrastructure needs, has the potential to avoid overinvestment in New Zealand"s electricity supply system. Transpower estimates that every gigawatt of peak demand avoided would save consumers approximately $1.5 billion.

Demand response is one-way communication from electricity suppliers to devices. The most common example in New Zealand is ripple control of hot water which has been used since the 1950s, and allows suppliers to turn off consumers" electric hot water systems when demand on the grid threatens to outweigh supply.

Businesses may also have demand response agreements with their electricity supplier, where they can choose to accept a request to reduce demand in exchange for financial reward.

Additionally, electricity users can be motivated to voluntarily shift their electricity demand to off-peak hours through lower-priced electricity rates and plans, or in response to an alert from suppliers.

A "smart home" is a household with smart devices capable of two-way communication with electricity suppliers. The smart device can respond to pricing and demand signals to optimise energy use in accordance with user preferences.

The ability to dynamically switch fuels, adjust production rates and optimise energy demands can make a huge

difference to the resilience and profitability of an energy-intensive commercial or industrial operation, while contributing to the stability of the electricity grid.

Businesses can optimise energy use within their facilities by deploying smart energy management systems that adjust lighting, HVAC, and other equipment settings based on occupancy, weather conditions, and energy prices.

Many businesses are investing in on-site renewable energy generation, to supplement grid electricity supply, primarily through the use of solar panels. When combined with battery storage, this system allows businesses to smooth out their electricity consumption profile, reduce peak demand charges, and provide grid support services like feeding electricity back into the grid when needed.

To help meet the challenge of increasing electricity demand, EECA has partnered with industry which is represented by the Electricity Engineers" Association (EEA) on the Demand Flexibility Common Communication Protocols Project (FlexTalk).

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