Energy storage economics new zealand

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In recent years, it has become common for utility-scale solar projects in Australia to include a grid-scale battery energy storage system (BESS) to provide energy generated by the solar farm to the grid outside of the times when the sun is shining.

Big batteries are currently booming in Australia, with 27large-scale batteries under construction at the end of 2023 (totalling approximately 5 GW / 11 GWh).[1] We expect that BESS will also become an increasingly important cog in New Zealand’s broader energy landscape and that we will see utility-scale solar projects incorporating batteries as a means of providing dispatchable generation during peak demand and enhancing grid stability.

A BESS is a number of large batteries that operate together as an energy storage facility, andis a bidirectional user of an energy network -meaning that it is able to ‘take’ energy from the grid (to store), and it can discharge that energy back into the system when required.

The uptake of BESS in New Zealand is particularly important given that it can help to solve one of the country'sbiggest energy challenges – meeting peak demand. In recent years, there have been ongoing concerns as to the reliability of New Zealand’s electricity supply following blackouts in 2021.[3] This is because:

This has been a well-publicised issue, with Transpower warning of potential blackouts during the upcoming winter period.[6] The Electricity Authority (EA) also published a Consultation Paper in January 2024, seeking industry input on potential solutions for peak electricity capacity issues.

BESS provides a solution to this problem, particularly whenpaired with new or existing intermittent renewable generating assets. During off-peak demand periods, excess generation can be stored and instantaneously provided to the grid during peak-demand periods. This active management of intermittent or variable generation is referred to as ‘firming’. Firming intermittent renewable generation has several benefits:

Energy arbitrage involves purchasing electricity to charge the batteries when wholesale prices are low and supplying that energy back to the grid when wholesale prices are higher. The EA has suggested that a system change towards five-minute blocks of time over which prices are calculated (rather than being smoothed over 30 minutes) could incentivise fast-start flexible response, especially from large utility-scale batteries, which are typically required for a few minutes or less.[8]

Implementation of system level changes that support both arbitrage and ancillary services markets would increase the economic feasibility of BESS projects and should encourage further capital investment into the

renewables sector.

The EA’s Consultation Paper ‘The future operation of New Zealand’s power system’ sought feedback from “new players in the markets for flexibility and ancillary services about barriers to greater participation in these markets within the power system.” That consultation period has recently closed, and we are eagerly anticipating the EA’s response to those submissions, particularly in relation to any proposed system changes to better accommodate BESS developments.

Analysis by University of Auckland Associate Professor, Energy Economics, Stephen Poletti, Victoria University Energy Policy Centre Professor Bruce Mountain and Victoria University of Wellington visiting scholar Geoff Bertram.

Wholesale prices in the New Zealand electricity market have soared over recent weeks, climbing as high as NZ$1,000 per megawatt hour. North Island pulp and paper plants have temporarily closed down because of the spike in costs.

On top of that, Energy Minister Simeon Brown has announced plans to investigate the feasibility of importing liquid natural gas (LNG) to help increase gas-generated electricity supply and lower prices in the process.

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