

Energy storage for grid stability australia

The integration of renewable energy sources in Australia's National Electricity Market (NEM) has significantly increased the demand for Frequency Control Ancillary Services (FCAS). Battery Energy Storage Systems (BESS) have emerged as a key player in providing these services, ensuring grid stability and generating substantial investment returns. This report delves into the numbers, examples, and financial returns associated with FCAS events and BESS investments in Australia.

FCAS is crucial for maintaining the stability of the NEM. It consists of eight contingency markets designed to handle sudden changes in supply and demand, ensuring the frequency remains at approximately 50 Hz. BESS has become the preferred technology for providing FCAS due to its rapid response times and low emissions (Energy-Storage.News) (Mondaq).

- Between 2003 and 2015, the average cost of FCAS regulation was \$1.6/MW/hr, which increased to \$26/MW/hr during 2016-2021 due to higher variability and renewable energy penetration (Mondaq).

- According to Cornwall Insight Australia, participants in the new Very Fast (VF) FCAS markets can earn an average of AU\$9.64 (US\$6.45)/MW/hr for Raise-1 and AU\$10.95/MW/hr for Lower-1 services?(Energy-Storage.News).

Since 2017, state initiatives and federal support have driven exponential growth in Australia's BESS market. By 2023, 25 large-scale batteries were operational, with more than 200 projects in various stages of development (pv magazine Australia).

- Known as the "Tesla Big Battery," this project has set benchmarks for BESS performance. Since its inception, it has provided substantial FCAS and energy arbitrage services, generating significant revenue.

- Energy arbitrage involves charging batteries when prices are low and discharging during peak demand. In 2022, the share of revenue from energy arbitrage jumped to 40%, highlighting its growing importance (Mondaq)

Financial support mechanisms, such as ARENA grants and loans from the Clean Energy Finance Corporation, play a critical role in mitigating the high capital expenditure of BESS projects. The federal government's Capacity Investment Scheme also offers long-term underwriting agreements, providing revenue certainty and attracting investment (pv magazine Australia).

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Web: <https://sumthingtasty.co.za/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

