

Flow batteries victoria

Yadlamalka Energy comprises of co-located Vanadium Flow battery energy storage (2MW - 8MWh AC) and Solar Photovoltaic (PV) farm (6MWp DC), integrated behind a DC-coupled inverter. We want to commercialise breakthrough technology to help meet Australia and the world's future energy needs.

Spencer Energy Project will supply a combination of solar power and battery storage services to the grid. The vanadium flow battery will take advantage of the significant intraday price variation in South Australia to time shift power from midday to peak periods in the evenings and mornings.

Through using breakthrough technology in the form of vanadium flow batteries, Spencer Energy Project, can deliver strong, economic infrastructure benefit to South Australia and at the same time support a low carbon economy.

Vanadium flow batteries are fully containerised, non-flammable units reusable over semi-infinite cycles, able to discharge 100% of the stored energy and do not degrade. In the words of Barack Obama "They are the multi-mega watt energy solution" and "one of the coolest things" he has ever spoken about.

Vanadium flow batteries have significant advantages over lithium in longer duration time shifting applications. The batteries will be able to discharge at a power of 2MW per hour for four hours. They are suitable for heavy cycling because, unlike lithium, they do not degrade.

Spencer Energy Project, will contribute to solving the distributed and intermittent energy problems that exist in South Australia, which are expected to intensify as renewable energy sources are relied on more and more.

The challenge is that none of the existing storage technologies really meet the need for medium duration (4+ hours) storage to address early morning and evening demand periods, particularly on days when wind is not available.

Australia has a long history of investing in pumped hydro in the Snowy Mountains, taking advantage of existing mechanical technology. Pumped hydro is an excellent source of energy with low Levelised Cost of Storage (LCOS), the industry measure used for comparing storage technologies, but requires huge capital investment and lengthy construction timelines. Suitable sites in Australia are few and far between and the most promising are in remote locations, some distance from markets and with significant transmission losses.

The market is now investing heavily into lithium-ion. Lithium batteries can make a useful contribution to solving the <1 hr problem of intermittency but are of short duration and deteriorate quickly, resulting in a limited lifetime. The main advantage of lithium storage is that it is relatively dense and hence is suitable for mobile applications, notably phones and cars.

Spencer Energy Project will contribute to Australia's move towards a low carbon economy, saving an estimated 4,000 to 4,300 tonnes of carbon dioxide per year. Carbon performance will be monitored along with the live carbon intensity of the National Electricity Market (NEM) and South Australia using a range of data feeds (i.e. electricitymap) to demonstrate the value of energy storage to increase low-priced and low-carbon periods.

The Project will co-locate PV (solar electricity panels) and Vanadium Flow battery storage behind a single network connection to optimise the capital costs associated with deploying the two projects independently and improve the efficiency of creating dispatchable and firm solar power. The solar farm will use the grid connection during sunshine hours and the battery will use the connection at other times.

Energy storage deployment has grown rapidly over the last five years primarily due to the significant growth of renewable energy projects which, as noted above, increase intraday wholesale energy market arbitrage opportunities and the requirement for flexibility to balance instantaneous supply and demand.

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