CONSORTIUM FOR BATTERY INNOVATION

EASTPENN ecoult energy storage solutions

Energy Storage Excellence

## LEAD BATTERIES: ENERGY STORAGE CASE STUDY

### Ecoult Energy Storage Solutions

# Successful Wind Farm Project

### New South Wales, Australia

The demand for wind energy, as a clean and renewable source of power, is increasing and has the potential to supply much more than current global energy consumption.

However, a key challenge that wind farms face is variability. Fast ramp rates often feature in wind power generation, and this can cause integration challenges and limit wind farm development.

"The Hampton Wind Farm project proved lead batteries could perform in the field in high rate, partial state of charge applications. The lessons learned from this project have guided Ecoult's development of advanced energy storage products for kilowatt and megawatt-scaled applications around the world."

John Wood, CEO, Ecoult

The Hampton Wind Farm project, the first phase of which was commissioned in September 2010, utilized lead battery storage to smooth the ramp rate of a wind farm before presenting it to the grid.

Part of a systematic effort to reduce the cost of each MWh of storage to control renewable energy variability, the project set out to demonstrate and optimize ways to apply UltraBattery® storage to constrain the 5-minute ramp rate.

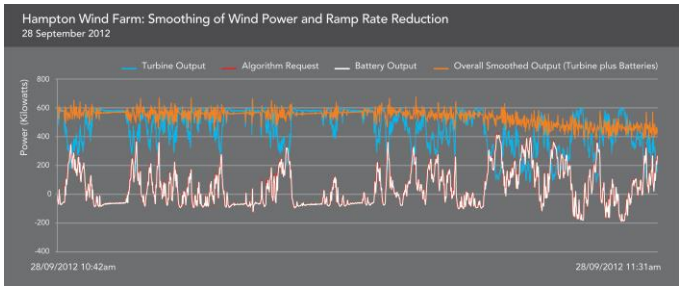
### Technical Specification

Ecoult provided and integrated a MW-scale smoothing system using UltraBattery technology.

Ecoult was able to demonstrate the ability to limit the 5-minute ramp rate to 1/10 of the raw output while applying storage with


a useable capacity (in kWh) 1/10 the rated output of the farm (in kW). For example, a 1 MW turbine would use 0.1 mWh of storage.

The storage solution at Hampton Wind Farm used optimized algorithims developed by CSIRO, and the overall storage architecture provides a robust and operationally reliable environment for the application layer to then further enhance use of the storage asset.




## About the Company

Ecoult is the global energy storage arm of the world's largest single-site lead battery manufacturing facility, East Penn Manufacturing (EPM), known worldwide for its quality and environmental excellence.

Ecoult provides software, hardware, systems integration and engineering to monitor and control the energy storage systems and maximize their capabilities. EPM manufactures the Deka UltraBattery cells inside every system.

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