

Demonstrating Energy Storage/Hemsby

Funding mechanism: LCNF Tier 1

Project budget: £225,000

Status: Live
Start date: September 2010
End date: January 2015



Project concept/overview/challenge

UK Power Networks installed a 200kWh Li-Ion battery at an electricity substation site in Hemsby, near Great Yarmouth, to understand the impact of small-scale electricity storage on a distribution network.

The battery technology is being tested to see how much electricity could be stored from local wind turbines when power generation exceeds demand, reduce voltage fluctuations and manage demand on the distribution network. The trial is exploring how electricity can be stored to overcome the challenge of intermittent power production from renewable sources.

Stakeholder benefits

- Enable more renewable generation on the network without conventional reinforcement.
- Understand the performance of the storage device on the network.
- Understand the benefit of storage compared to other devices with some, but not all, of the capabilities such as a STATCOM.
- Identify any practical difficulties and explore solutions.
- Indicate network characteristics where electricity storage may present a compelling solution.

What we are doing/deliverables

- Test the storage device's capabilities on a real electricity network.
- Demonstrate load-shifting capability of the device.
- Study how a battery could manage larger amounts of demand or generation.
- Consider and rank the value of other proposed uses for batteries, both to electricity network operators and intermittent generators.

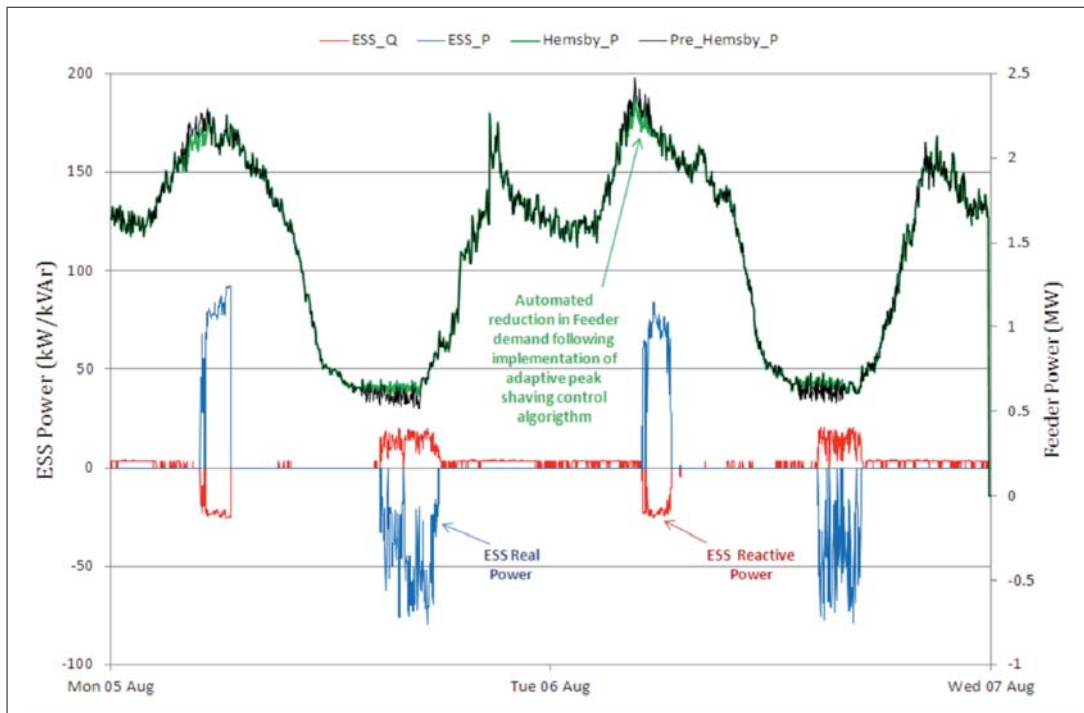
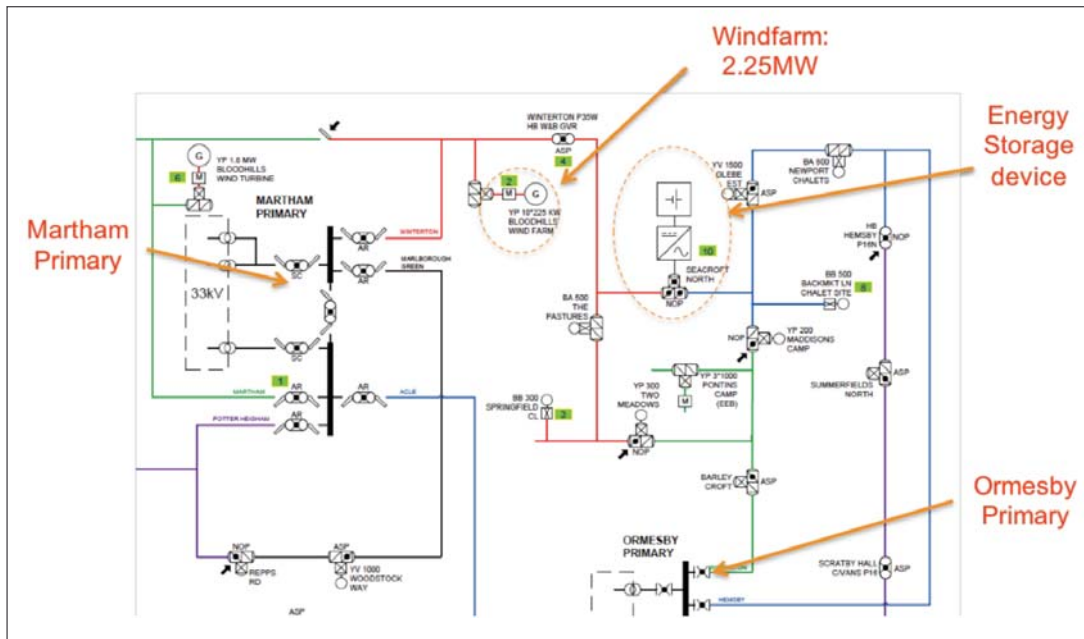
- Understand the potential lifetime of the battery.
- Embed the findings into a design tool for network planners and share them with the industry.

Findings

- The first automated control algorithm has been implemented. It manages peak loading with the aim to allow more wind generation on a constrained network.
- The communications infrastructure, which provides real-time network measurements as control inputs, has been successfully installed and commissioned.
- Our studies show that the installation footprint does not necessarily increase significantly for installations with a higher rating and/or energy capacity.

Next steps

- Implement a novel, more flexible load-shifting algorithm that will cater for more types of network events, such as under-voltage at remote feeder locations, or reverse power flows.
- Feed our learning in to our new LCNF Tier 2 project 'Smarter Network Storage', based on the initial outputs of this project. This trial will have a larger capacity and the study will include evaluating business models and participating in markets.



Partners

