Case study: Energy storage, integrated with solar PV, to provide distribution network services

RES (Renewable Energy Systems) a global renewable energy company headquartered in the UK, which has pioneered energy storage projects in the US and Canada, is in the construction phase of its first UK energy storage project. RES has signed a “full warranty wrapped” Engineering, Procurement and Construction (EPC) contract with Western Power Distribution (WPD) to integrate a 300VA/640kWh Lithium ion Battery Energy Storage System with an existing 1.5MW solar park at Copley Wood in Somerset. The project will demonstrate nine applications of energy storage within a distribution network.

A full warranty wrapped EPC contract

This contract represents one of the first energy storage projects in the UK to be delivered under a fully wrapped EPC contract. This contract provides a “one-stop shop” for all warranties in respect of the battery itself, the control system and balance of plant. RES has pioneered this type of contract at its energy storage projects in the US and Canada, where it is still prevalent for separate warranties to be provided for each element of the project. With clients able to manage any warranty issues via one point of contact - RES - this provides peace of mind as well as an easier way to manage warranties.

Increasing cost effectiveness of grid operations and adding value to solar PV

RES will deliver the project to Western Power Distribution (WPD), the largest Distribution Network Operator (DNO) in the UK. This project will demonstrate that embedding energy storage with solar PV creates value in the direct operation and sale of electricity from the solar park and in offering services to the DNO. In the future, it is expected that solar PV owners could integrate energy storage into solar projects as ‘business as usual’. This project will demonstrate that the solar PV/energy storage operator can sell services to the DNO to:

- Shape generation profile to demand
- Raise the minimum demand to limit voltage rise
- Deliver voltage control
- Improve smoothing and power quality
- Change peak lopping level
- Deliver combinations of the above

It will demonstrate that a solar PV owner can also benefit directly from:

- Selling electricity for a higher price per kWh
- Peak lopping generation to enable larger solar parks

“An important project to demonstrate the value of battery energy storage to both solar developers and distribution network operators”

Gordon McDougall - RES Managing Director, Western Europe

“It will be a real benefit to the network to demonstrate network management from distributed energy storage assets”

Jenny Woodruff - Innovation & Low Carbon Networks Engineer, WPD
RESolve - an advanced control system to deliver multiple services

The integrated Battery Energy Storage System will use RESolve. This is RES’ in-house developed Energy Management System which is already deployed on almost 90MW of energy storage and over 250MW of wind assets. RESolve controls the battery system 24/7 to deliver the services from the battery system accurately, reliably and repeatedly.

As well as the applications delivered by this project, RESolve can deliver a wide range of additional control modes such as frequency regulation, frequency response, spinning reserve and renewable firming that allow the owner or operator of an energy storage project to access multiple revenue streams from a single energy storage system to maximise the value of the asset.

A track record to be proud of

RES’ track record in energy storage gives its global clients peace of mind when buying turnkey energy storage systems. RES has been active in energy storage for over six years and in 2015 was named as one of the world’s top three energy storage integrators by Navigant Research. RES has completed six energy storage projects using multiple technologies in several markets. These include one of the world’s first non-recourse debt financing (two 19.8MW projects). RES offers development and fully wrapped EPC services for energy storage, as well as its proprietary algorithm and controls system, RESolve, and offers similar services in renewable energy, transmission and demand side management.

Energy storage - powering the change to a low carbon network

WPD’s responsibilities include running the distribution network in the south-west of England; the sunniest part of the UK. This network is currently saturated with solar PV grid connections and without the flexibility offered by energy storage it is challenging for solar developers to secure new grid capacity at reasonable cost.

The energy storage system supplied by RES will be operated as the centre piece of a major initiative being run by WPD, and their solar partner British Solar Renewables (BSR), to demonstrate that energy storage, when integrated with solar PV delivers wide benefits, including:

- Increased levels of renewable generation within distribution networks through improving feasibility of grid connection requests and project economics
- Increased efficiency and cost effectiveness of the grid operations, without a requirement for subsidies, through provision of ancillary services
- Delivery of secure low carbon electricity at least cost to consumers

About RES

RES is one of the world’s leading independent renewable energy companies with operations across Europe, the Americas and Asia-Pacific. At the forefront of renewable energy development for over three decades, RES has developed and/or built more than 10,000MW of renewable energy capacity worldwide and currently manages operations for over 2,000MW. RES has expertise in a range of renewable energy technologies including both onshore and offshore wind, solar, as well as energy management technologies including energy storage and demand-side management.

Contact us to learn how energy storage can benefit your system

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“Our experience of delivering almost 90MW of energy storage globally gives us the ability to provide reliable energy storage solutions”

Gordon McDougall - RES Managing Director, Western Europe

“Overall it lays the path for more solar to be built in the future and to improve grid operations without government subsidy”

John Prendergast - RES Energy Storage Manager

RESolve energy control system