Southern California Edison Company
Tehachapi Wind Energy Storage Project

Project Description

The Tehachapi Wind Energy Storage project is evaluating the performance of an 8 MW, 4 hour (32 MWh) lithium-ion battery system to improve grid performance and integration with large-scale wind-powered electricity generation. Southern California Edison (SCE) will site the system at their Monolith substation on the Antelope-Bailey system. Antelope-Bailey is part of the Tehachapi Wind Resource Area, where up to 4,500 MW of wind resources will come online by 2015. The project team will measure performance under 13 specific operational uses: voltage support and grid stabilization; decreased transmission losses; diminished congestion; increased system reliability; deferred transmission investment; optimize size and cost of renewable energy-related transmission; system capacity and resources adequacy; renewable energy integration; wind generation output shifting; frequency regulation; spin/non-spin replacement reserves; ramp rate; and energy price arbitrage. Most of the operations either shift wind and conventional power to meet peak load and other electricity system needs with stored electricity, or resolve grid instability and capacity issues that result from the interconnection of wind generation resources. SCE will also demonstrate the ability of lithium-ion battery storage to provide nearly instantaneous (less than 20 milliseconds) maximum capacity for supply-side ramp rate control to minimize the need for fossil fuel-powered back-up generator operation.

Goals/Objectives

- Validate the performance and effectiveness of lithium-ion technology
- Demonstrate the integration of intermittent of wind energy
- ***Develop a smarter, more efficient electrical grid***
- ***Advance market readiness of utility-scale storage***

Key Milestones

- Completion of energy storage system manufacturing plan (November 2011)
- Installation of battery and inverter completed (June 2012)
- Two year demonstration complete (December 2014)

Anticipated Benefits

- Create/retain jobs
- ***Improve power quality***
- Increase system reliability
- ***Integrate more clean, renewable energy***
- ***Foster energy independence***

CONTACTS

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PARTNERS

A123 Systems
California Independent System Operator
Quanta Technology
Cal Poly Pomona

PROJECT DURATION

2/08/10–02/07/15

BUDGET

Total Project Value
$54,856,495

DOE/Non-DOE Share
$24,978,264/$29,878,231

EQUIPMENT

A123 Batteries
Smart Inverter
Transformers
Communication Gateway
Shunt Capacitor Bank
Phasor Measurement Unit

DEMONSTRATION STATES

California
CID: OE0000201

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