Hawaii Natural Energy Institute

Managing Distribution System Resources for Improved Service Quality & Reliability, Transmission Congestion Relief & Grid Support Functions

Project Description

The overarching project objective is to develop and demonstrate a distribution automation solution that aggregates distributed generation (DG), energy storage, and demand response technologies in a distribution system to achieve both distribution and transmission level benefits. Ideally, the application of these new technologies would increase system reliability and improve power quality along with reducing costs to both the utility and its customers. The project is broken up into two phases. In Phase One, energy management architecture will be developed and validated to meet all needs, focusing on energy management at the distribution level. In Phase Two, the capabilities will be demonstrated at a Maui Electric Company, Ltd. (MECO) substation at Wailea on Maui. A major goal of the program is to incorporate advanced technology into the Maui grid that will allow for a reduction of peak energy consumption of at least 15% of the automated feeder upon completion. The 200 MW island system will include roughly 72 MW of wind generation and over 15 MW of solar PV. As of June 5, 2013 12 MW of storage have been installed on the island.

Goals/Objectives

- Enable Distribution System Assets to Support the Transmission & Generation Systems
- Using Microgrid-Based Distribution Resources in the Context of SmartGrid
- Integrate Legacy Systems with the Developed, Advanced Applications
- Increase System Reliability and Improve Quality Along with Reducing Costs to Both the Utility and its Customers

Key Milestones

- Site Selection for Demonstration (January 2012)
- Testing and Results Reporting (August 2013)
- Demonstration Equipment Installation (June 2013)
- Demonstration Site Testing Reporting (Through July 2014)

Benefits

- Reduction of a Distribution System's Peak Energy Consumption from the Transmission Grid
- Improved Voltage Regulation and Power Quality Within Selected Distribution Feeders
- Significant Increases in Distributed Solar Technologies Being Installed at Residential and Commercial Locations
- Reduction of Transmission Congestion

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PARTNERS

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PROJECT DURATION

10/01/2008–9/30/2014

COST

Total Project Value
$14,382,980
DOE/Non-DOE Share
$6,994,980/$7,388,000

DEMONSTRATION STATES

Hawaii

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