



Raytheon Ktech Flow Battery Solution for Smart Grid Renewable Energy Applications

Project Description

Raytheon Ktech and EnerVault will integrate EnerVault's Vault-20 battery energy storage system (250 kW, 1 MWh) with a Helios dual-axis tracker 180 kW photovoltaic (PV) system. The system will be deployed at an agricultural site in California's Central Valley. It will store the energy generated and dispatch power to run an irrigation pump and inject energy back into the utility grid during peak times to help offset demand from a section that comprises 4 percent of California's electricity demand. The modularity of the system provides scalability for multi-megawatt deployments. The Vault-20 consists of electrolyte tanks and transporters which house stacks, pumps, control system, and power conditioning systems. Technology development will progress from 15x15 cm lab-scale cells and 20 layer stacks, to a 2-5 kW prototype system, to a 30kW alpha system, and conclude with a 250 kW beta system. EnerVault plans to begin manufacturing flow battery stacks in its Northern California plant within 12 months of project completion.

Goals/Objectives

- Develop a modular system rated at 250 kW and 1 MWh that fits inside a standard shipping containers to minimize onsite deployment time and maximize cost
- Integrate a battery energy storage system with a variable renewable energy resource
- Reduce cost and environmental impacts

Key Milestones

- 2-5 kW prototype system demonstration (April 2011)
- 30 kW alpha stack demonstration (May 2013)
- 250 kW Vault-20 beta unit installed at demonstration site (October 2013)
- 250 kW Vault-20 beta unit demonstration (July 2014)

Benefits

- 50-150 direct and 175-525 indirect jobs created
- Energy cost lowered
- Greenhouse gas emissions reduced
- Global competitive edge gained by the U.S



CONTACTS

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PARTNERS

EnerVault Corporation
JKB Energy
Montpelier Nut Company

PROJECT DURATION

8/6/2010–9/30/2014

BUDGET

Total Project Value
\$9,528,568

DOE/Non-DOE Share
\$4,764,284/\$4,764,284

EQUIPMENT

Inverter
Impedance Analyzer
Electric Load/Supply 20kW, 60kW

DEMONSTRATION STATES

California

CID: OE0000225

*Managed by the National Energy Technology
Laboratory for the Office of Electricity Delivery
and Energy Reliability*

Raytheon Ktech