



VionX Energy Distributed Energy Storage System

Project Description

VionX Energy and its partners will apply a breakthrough technology improvement from United Technologies Corporation (UTC) to build a vanadium redox flow battery based energy storage system (ESS) for load shifting, peak shaving, and renewable system integration. The 6-10 hour battery will not degrade as quickly as lithium ion and lead acid batteries, allowing a lifetime of 20 years. The ESS is a fully integrated system that comprises energy storage, power conditioning, system control, and thermal management subsystems. Two ESSs are to be demonstrated with National Grid at locations in Massachusetts. One ESS will be integrated into a single 500kW multi-hour system installed next to a 605 kW photovoltaic (PV) array in Everett, MA and the other ESS will be interfaced with a 600 kW wind turbine at the Holy Name High School feeder in Worcester, MA. National Grid will deploy, operate, and monitor the aggregated 1MW ESS's in their respective locations for two years.

Goals/Objectives

- Demonstrate competitively priced, multi-megawatt, long-duration batteries for utility grid applications
- Validate vanadium redox flow batteries in grid-connected application
- Demonstrate multiple approaches to battery integration with intermittent renewable energy systems with aggregated sites: on a customer site, and at a substation
- Develop and verify creative control algorithms to manage fleet operation of energy storage systems that are not co-located

Key Milestones

- Detailed engineering design complete (October 2015)
- Construction, installation and integration of all units complete (February 2016)
- Data collection and analysis complete (January 2018)
- Final Report Submitted (April 2018)

Benefits

- 20 year lifetime and 6-10 hours of operation
- Lower peak demand and distribution losses
- Grid power quality improved
- Electricity reliability improved



CONTACTS

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PARTNERS

National Grid
Worcester Polytechnic Institute
Leidos, Inc.

PROJECT DURATION

8/13/2010–1/31/2018

BUDGET

Total Project Value
\$12,514,660

DOE/Non-DOE Share
\$6,062,552/\$6,452,108

EQUIPMENT

Vanadium Redox Flow Batteries
Advanced Metering Equipment and
Sensors
Transformers
Switchgear
Circuit Breaker/Protective Relays

DEMONSTRATION STATES

Massachusetts

CID: OE0000224

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