In June 2012, Aquion Energy, Inc. completed the testing and demonstration requirements for the U.S. Department of Energy’s program with its low-cost, grid-scale, ambient temperature Aqueous Hybrid Ion (AHI) energy storage device.

During the three-year project, Aquion manufactured hundreds of batteries and assemble them into high-voltage, grid-scale systems. This project helped them move their aqueous electrochemical energy storage device from bench-scale testing to pilot-scale manufacturing.

The testing successfully demonstrated a grid-connected, high voltage (>1,000 V), 13.5 kWh system with a 4-hour discharge. Additionally, testing characterized the energy storage capacity of the units, the response to various signals, compliance with utility interconnection standards, battery and power conversion system efficiency, and effectiveness under various cycles typical of the applications being validated. Advanced system modeling will demonstrate application-level testing and the functionality of the unit with respect to its ability to respond to external control signals and properly interact with the electric grid when carrying out relevant sequences.

Aquion Energy’s AHI Systems

Aquion is demonstrating an AHI cell, which can be combined into grid-scale electric energy storage solutions.
Goals

- Achieve the following technical targets:
  - Projected capital cost of less than $250/kWh at pack level
  - Deep discharge cycle life of greater than 10,000 cycles
  - Volumetric energy density of greater than 20 kWh per cubic meter
  - Lifetime of over 10 years
- Demonstrate a high voltage test system >10 kWh

Project Partners

- Aquion Energy, Inc.  
  http://www.aquionenergy.com
- Carnegie Mellon University  
  http://www.cmu.edu

Related Reading


For More Information

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Importance of Energy Storage

Large-scale, low-cost energy storage is needed to improve the reliability, resiliency, and efficiency of next-generation power grids. Energy storage can reduce power fluctuations, enhance system flexibility, and enable the storage and dispatch of electricity generated by variable renewable energy sources such as wind, solar, and water power. The Office of Electricity Delivery and Energy Reliability Energy Storage Program funds applied research, device development, bench and field testing, and analysis to help improve the performance and reduce the cost of energy storage technologies.