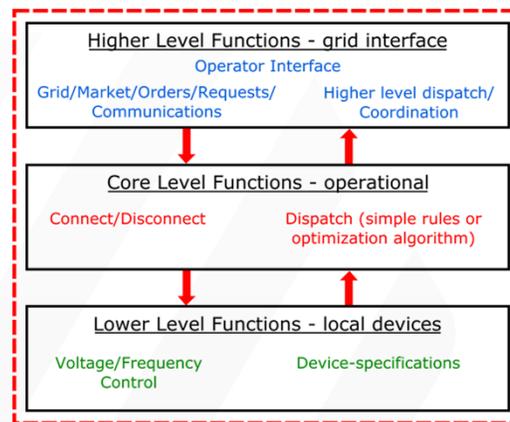


Standards and Test Procedures for Interconnection and Interoperability

CHALLENGE

Next-generation smart grid technologies include distributed generation, battery storage, electric vehicles, and dispatchable loads, among others. To achieve widespread deployment of these technologies on the electric grid without compromising grid reliability, safety, or security, the devices must coordinate among each other. Standards for interconnection and interoperability enable coordination, allowing devices to smoothly connect and communicate with the electric grid during normal operation and unexpected events. However, in such a connected grid, standards must not only be consistent across all devices of a single technology, but across different technologies that interact on the grid.



High-level example of coordination needed from higher (grid service) functions to lower level (device) capabilities.

APPROACH

This project teams seven DOE national laboratories with industry collaborators to identify key, near-term actions for improving and validating the standards for smart grid technologies. Through the abilities enabled by these standards, relevant technologies can work together to provide specific grid services when needed.

To improve coordination between technologies, the team is developing a method for prioritizing actions across different technologies and creating a gap analysis document. This work will identify specific changes to standards that could improve coordination between key technologies. In addition, the team will support the acceleration and establishment of these standards and revisions by developing and validating new conformance test procedures for key technologies and grid services.

At-A-Glance

PROJECT LEADS

- **David Narang**
National Renewable Energy Laboratory
david.narang@nrel.gov
- **Peter Schwartz**
Lawrence Berkeley National Laboratory
pmschwartz@lbl.gov

Partners

- Smart Grid Interoperability Panel
- National Institute of Standards and Technology
- GridWise Architecture Council
- Electric Power Research Institute
- Standards Development Organizations
- Utilities
- Vendors

BUDGET

\$3.6 million

DURATION

March 2016 – March 2018

TECHNICAL AREA

Devices and Testing

Lead: Ben Kroposki

National Renewable Energy Laboratory

benjamin.kroposki@nrel.gov

EXPECTED OUTCOMES

The gap analysis and prioritization results will help industry groups and other organizations that develop standards focus on solving technical issues in a coordinated manner. This should enable faster implementation of revised standards that are harmonized across technologies. Ultimately, better-harmonized standards will make it easier to deploy

larger volumes of smart devices onto the grid and lead to expanded markets for the devices. This project will also strive to develop and validate new tests that can be used by standards development organizations to ensure end-to-end interoperability.

LAB TEAM



Launched in November 2014 under the U.S. Department of Energy's Grid Modernization Initiative, the GMLC is a strategic partnership between DOE Headquarters and the national laboratories, bringing together leading experts and resources to collaborate on national grid modernization goals. The GMLC's work is focused in **six technical areas** viewed as essential to modernization efforts:

Devices and Testing | Sensing and Measurements | Systems Operations and Control
Design and Planning | Security and Resilience | Institutional Support