

Interoperability

CHALLENGE

The nation's power grid needs the flexibility to accommodate internally or externally driven changes, either expected or unexpected. One example is the integration of distributed energy resources such as solar or wind power. Our energy system is also being revolutionized by the deployment of intelligent devices and systems that offer more flexibility to coordinate operation of grid infrastructure with end-use systems.



National labs, electricity industry leaders, and stakeholders are developing a strategy, methods, and tools to simplify integration and secure interaction of devices and systems making up the grid.

The key to delivering greater flexibility and reliability in the face of these changes is interoperability—the ability of different devices and systems to communicate and operate seamlessly. For efficient grid operation, the broader electricity industry must have access to general interoperability requirements, methodologies, and tools that simplify the integration and secure interaction among the many devices and systems that make up the grid.

APPROACH

Stakeholder engagement is critical for advancing interoperability because policies, conventions, guides, and standards are only effective when adopted at the community level. Pacific Northwest National Laboratory, Lawrence Berkeley National Laboratory, Argonne National Laboratory, and the National Renewable Energy Laboratory are partnering with electricity industry leaders and stakeholders to address this challenge. These diverse organizations are collaborating closely to accomplish the following:

At-A-Glance

PROJECT LEADS

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PARTNERS

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

BUDGET

\$3 million

DURATION

April 2016 – March 2019

TECHNICAL AREA

Devices and Testing

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- Develop a strategic vision for interoperability that addresses the ability to readily integrate intelligent devices and systems, particularly at the grid edge, and obtain buy-in to this vision from public and private stakeholders whose participation will be necessary to effect change. To this end, a “Declaration of Interoperability” has been developed with significant stakeholder engagement to secure industry commitment to interoperability principles.
- Build increased electrical industry involvement with and consensus around interoperability principles through engagement at stakeholder meetings.
- Develop tools that measure the maturity of interoperability in the technical domains—for example, buildings, electric vehicles, or distributed energy resources—to understand the current state of interoperability and where it can be proven.
- Identify gaps in integration—such as time-consuming and error-prone configuration processes—and develop roadmaps to address the gaps using interoperability maturity assessment tools.
- Incentivize industry to develop tools that encourage procurement of interoperable products and services, through interoperability challenges and prizes that encourage participation and build a community ethic of interoperability improvement.

EXPECTED OUTCOMES

This project will promote alignment and commitment of stakeholders within the broad electricity industry relative to the future of interoperability, including developing a robust strategic vision for integrating devices and systems into the nation’s power grid. It will also develop and provide cost-effective methods and tools the electricity industry needs to identify gaps in interoperability as well as develop roadmaps to address the gaps.

Participation in the development and execution of the resulting roadmaps will provide significant benefits to the electricity industry, including easier integration of renewables and associated long-term costs, reduced complexity when new devices and systems are incorporated, and reduced ambiguity—all combining to ensure the continued evolution of a reliable, secure, efficient, and flexible electric grid into the future.

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