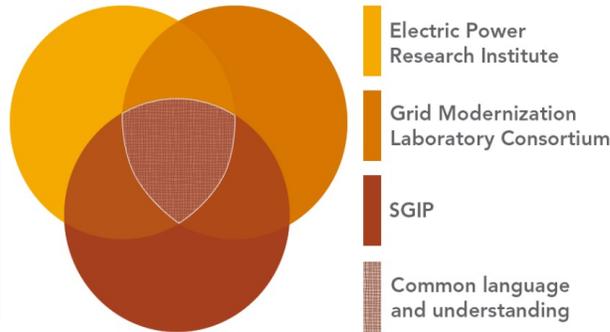


Grid Architecture

CHALLENGE

The nation's power grid is continually faced with mounting complexity, which adds increased risk to policy and investment decisions. Methods and tools are needed to help decision makers in the electric industry—such as regulators, utilities, and technology developers—manage this complexity as well as identify hidden interactions and technical gaps that could result in unintended consequences, limited benefit realization, or stranded electricity investments as changes are made to modernize the grid.



The Grid Architecture project is developing the architecture and tools the electric industry needs to address challenges related to grid modernization.

APPROACH

A team of researchers from multiple national laboratories is addressing this challenge with several key utility industry partners. They are building a set of new architectures and associated tools that will be vital to helping stakeholders assess situations surrounding grid modernization. The effort includes the following:

- **Development of grid architecture**—the highest level description of the complete grid—for a range of industry segments, regions, and future trends. This includes drawings and specifications that describe the forward-looking structure of the modernized grid, as well as explanations of potential impacts on a host of areas, such as physical and cyber security and integration of distributed energy resources.
- **Collaboration with key partners and industry stakeholders** to glean input and priorities that will result in the most impactful architecture and tools. The partner list will continue to expand to include utilities, regulators, product developers, and system integrators, researchers, and energy services suppliers as the project proceeds.
- **Coordination and collaboration with other grid modernization projects** to ensure consistency of a modernized grid framework across all projects.

At-A-Glance

PROJECT LEADS

- **Jeff Taft**
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PARTNERS

- GE Grid Solutions
- Electric Power Research Institute
- George Washington University Law
- Smart Electric Power Alliance.
- Omnetric Group
- California ISO
- Utility Technology Council
- GridWise Alliance
- Midcontinent ISO
- Sacramento Municipal Utility District
- Key industry consultants

BUDGET

\$3 million

DURATION

April 2016 – September 2019

TECHNICAL AREA

System Operations and Control

Lead: Jeff Dagle

Pacific Northwest National
Laboratory

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EXPECTED OUTCOMES

This project will result in a set of architectural depictions, tools, and skills for the utility industry and its extended stakeholders to provide a common basis for roadmaps, investments, technology and platform

developments, and new capabilities, products and services for the modernized grid.

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