



Plug-and-Play Power Grid

By Lisa V. Wood, executive director of the Institute for Electric Innovation and vice president of The Edison Foundation.

As new energy services, technologies, and connection points with customers multiply, today's electric distribution grid is evolving into a broad platform that enables new services and technologies to "plug" in. For electric utilities, which operate the plug-and-play distribution grid, this means seamlessly integrating new energy resources, technologies, and services.

Public policies, new technologies, innovation, and consumer needs are driving this transformation of the electric distribution grid. Across the United States, this evolution is well underway with significant investments in grid technologies, digitization, data analytics, distribution sensing and monitoring, and controls to enhance operational efficiency and integrate new resources. While significant progress is being made, there is still more work to be done.

Providing and Enabling More Value

The distribution grid platform is evolving in real time to continuously meet three needs—integrating new energy resources, providing customer solutions, and optimizing the grid itself. The intersection of these three components creates new services for customers, new processes for utilities, and new interfaces among customers, energy resources, third-party providers, and utilities. For example:

- ▶ The distribution grid will provide and enable more "value" to customers as new assets and services are added to it. For example, utility-provided integration of distributed energy resources and grid resource management is becoming increasingly sophisticated as a result of new technologies and data analytics. These new resources also require new tools to optimize overall system efficiency and energy use.
- ▶ Managing and optimizing the distribution grid platform mean developing the capability to manage all grid assets and business systems to achieve greater reliability, resiliency, and energy optimization. This is a significant undertaking and requires substantial

investment. Connecting operational technology and information technology will lay the foundation for a smarter distribution system.

Today's power grid is evolving from a one-way centralized power delivery system to a more open, flexible, and multipoint digitized network (or platform) with a collection of technologies and assets, some controlled by the utility and some not. (See Figure 1.)

FIGURE 1



Source: PG&E

The Grid of Things

Utilities are investing almost \$21 billion in the distribution grid annually. Managing the evolving and integrated distribution "grid of things" will require utilities to continue to invest in upgrading and modifying their distribution systems.

However, this new business environment relies increasingly on utilities collaborating with three key strategic partners: technology companies to bring innovative products and

services to the market and to set and deploy standards; regulators to define appropriate new business models for the plug-and-play grid platform; and customers to provide the inspiration and solutions they want.

In March 2015, The Edison Foundation Institute for Electric Innovation will hold its 5th annual **Powering the People** (PTP) event in Washington, DC. PTP is a celebration of innovation in the electric power sector, and this year's event will focus on the evolving power grid as a plug-and-play platform for new energy services and technologies. This event is an opportunity for the electric utility industry, technology companies, regulators, federal policymakers, state and local officials, consumer advocates, and customers to engage in dialogue and discussion about the broader grid platform that is emerging.

A fully functioning power grid platform is a national asset. Electric utilities are the operators of the grid platform today and are indispensable to the scaled deployment of grid-related assets and technologies because only utilities have the end-to-end platform visibility to ensure reliability, resiliency, affordability, and safety. **EP**

The Institute for Electric Innovation focuses on advancing the adoption and application of new technologies that will strengthen and transform the power grid. The Institute's members are investor-owned electric utilities that represent about 70 percent of the U.S. electric power industry and are committed to an affordable, reliable, secure, and clean energy future.



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