



The Power Grid: An Evolving Platform

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

The power grid is evolving into a broad platform for integrating new energy services and technologies.

In light of these trends, more than 60 senior executives from electric utilities and technology companies convened in June for the Institute for Electric Innovation's Management Committee and Partner Roundtable meetings to discuss key opportunities and challenges facing the industry over the next five to 10 years.

These discussions focused on some of the new interfaces, processes, and services that will be needed to meet the needs of the new energy consumer, integrate new energy resources into the grid, and better connect legacy assets and systems with new ones.

Simple Choices, Complex Issues

The public loves solar power. Hence, a key role for the electric utility sector is to develop and integrate solar photovoltaics (PV) into the nation's power grid. The utility plays a pivotal role in the development of solar resources—from large-scale solar projects to community and rooftop solar projects.

From multiple perspectives—economics, consumer energy choices, and fairness—utility-managed community solar makes good business sense. Tucson Electric Power (TEP), a subsidiary of UNS Energy, has developed 22 megawatts of community solar for its residential, small commercial, and municipal government customers. Community solar provides all customers with the choice to 'go solar.' At the same time, when utilities control the location of the solar asset on the power grid, the economics make much more sense and everybody wins.

"Our program provided customers with a new, flexible way to go solar while allowing us to realize economies of scale through larger systems that better support our local system needs," said David Hutchens, president and

CEO of UNS Energy. "We've also preserved our ability to modify the program and develop new offerings to satisfy our customers' emerging energy demands."



Andy Vesey, executive vice president and chief operating officer of AES Corporation, discusses the evolving power grid at IEI's recent meetings.

The integration of new energy resources also is influencing the convergence of information technologies (IT) and operation technologies (OT). A key benefit of the IT/OT convergence is grid visibility and using that visibility to optimally manage grid assets.

"The three phases of IT/OT convergence are advanced metering infrastructure integration, analytics, and new business opportunities," said Steve Callahan, IBM's vice president of global strategies and solutions. For most utilities, the new business opportunity phase is just emerging.

As new resources are incorporated at the edge of the distribution system, new capabilities are needed to ensure that the grid operates efficiently. Duke Energy, Pacific Gas and Electric Company, Pepco, and several other utilities, supported by data analytic capabilities, are developing tools to better understand and predict distributed generation impacts on distribution feeders and circuits and investing in distributed energy resource management systems to optimally integrate these resources into the grid. Improved management of grid resources reduces the cost of integration and improves grid efficiency.

But new technologies, new resources, and data analytics alone are not enough. The regulatory environment is a key factor in the evolving power grid platform. This means looking out for the consumer, allowing utilities to enable and participate in the scaled deployment of new technologies and grid-related assets, and recognizing that an integrated grid platform improves performance. A fully functioning and integrated power grid is a national asset. **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.