



The Edison Foundation

INSTITUTE for ELECTRIC INNOVATION

Remarks for Panel Discussion: Electricity Distribution and End Use: How Do We Manage Challenges and Opportunities?

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Prepared by
Lisa Wood, Executive Director, Institute for Electric Innovation &
Vice President, The Edison Foundation

Good afternoon. I'm Lisa Wood, Executive Director of the Institute for Electric Innovation (IEI) and Vice President of The Edison Foundation. IEI's members are the nation's investor-owned electric utilities. We also have about 25 technology partners representing both large and small companies that are actively working with the electric utility industry in the transformation that is underway. IEI is the foundation arm of the Edison Electric Institute. Thank you for the opportunity to be part of this discussion today about electricity distribution and end use.

As EEI President Tom Kuhn explained earlier today, the electric power industry is undergoing a profound transformation – change is underway all across the country, driven by technology, policies (both state and federal), and changing customer needs and expectations. I'm going to talk about some of those changes and how regulation might adjust to facilitate this transformation.

Megatrends Driving Electric Utility Industry Transformation

As Tom also explained, three megatrends are at the core of this transformation.

First. The transition to a clean energy future. As a nation, we are investing increasingly in renewable energy, transitioning from coal to natural gas, continuing to generate electricity using nuclear energy, and pursuing energy efficiency. In fact, the U.S. electric power industry has already reduced carbon emissions 15 percent below 2005 levels (equivalent to 1996 levels). At the same time, modernization and digitization of the grid enable the integration of more carbon-free renewables, both large-scale and distributed. In fact, we expect exponential growth in solar over the next decade, in all sizes.

Today, the power industry is the largest investor in clean energy. We provide about **60 percent of all installed solar capacity** in the U.S. and virtually all of the wind energy. We are investing about \$9 billion per year in solar energy today. We expect to continue that investment in solar each year over the next several years.

Second. A more digital and distributed power grid. The power grid is becoming "smarter" – a digital communications overlay with millions of sensors that is making the grid more controllable and potentially self-healing. The electric utility industry is investing more than **\$20 billion per year** in the distribution grid alone, which will enable the connection of distributed energy resources as well as new devices in our homes and businesses. Many of these resources and devices will interact with the grid, resulting in more reliable, resilient, and efficient grid operations. The digital grid is evolving into a multi-path network of power and information flows that will use data analytics for grid management and optimization from end to end.

Third. Individualized Customer Services. As the grid becomes increasingly digital and distributed, customization of services for electricity customers will continue to grow. Large commercial customers, for example, increasingly want **renewable energy** to meet their corporate sustainability goals; cities and towns are requesting customized services, such as help with micro-grids, smart city services, and/or renewable energy; and, some residential customers want renewable power exclusively or want rooftop solar to generate their own electricity.

Regulation for the Evolving Power Grid

Although these **mega-trends** are driving change, the speed of transformation, to a great extent, will depend on whether **regulation** evolves to accommodate these changes.

The business model of electric utilities must change to reflect the changing generation mix including distributed energy resources. At the same time, the grid is more complex, and customers have different expectations, meaning that the regulatory model also must change.

The electric utility business model can only change to the extent that regulation adjusts to facilitate these changes. Over the next decade, regulation will have to provide a way for utilities to achieve new corporate and policy goals that meet the changing needs of their customers.

Value of the Distribution Grid

In the U.S., the movement toward a more digital and distributed power grid is well underway. The need for more reliable and resilient grid operations, for greater efficiency and control, and for the connection and interaction with the "Internet of

Things" – every device with an IP address – creates new challenges, roles, and opportunities. The deployment of close to 65 million digital smart meters to U.S. households (i.e., about half of all U.S. households) is one key building block. The integration of ever more distributed energy resources is another. *Utilities are playing a central role as the integrators and enablers of this evolving Grid of Things™.*

We expect the utility industry's current \$20 billion annual investment in the distribution grid to continue over the next several years. *But, for the grid to continue to evolve to provide the services that customers want and to integrate an increasing number of "things," all customers who use the grid will need to continue to share in the cost of maintaining and operating the grid.* This will entail relatively moving toward a services model rather than a throughput model, a move that requires regulatory change.

Paying for the Evolving Power Grid

Today's utilities are providing safe, reliable, affordable, and increasingly clean electricity. In addition to this, tomorrow's utilities will be providing even cleaner electricity, providing more individualized customer services, integrating and connecting more and more distributed energy resources, and providing greater reliability and resilience. *The fundamental question is this: how do we change current ratemaking and rate design practices to accommodate the increasingly important role of the distribution grid and the grid services it provides?*

Alternative regulatory approaches can lead to the appropriate recovery of the costs associated with maintaining, operating, and investing in the power grid and providing grid services. Any approach adopted needs to provide stability for recovery of the costs

of the power grid and the services it provides; must hold the utility accountable for delivering specific customer benefits and services; and must ensure that all customers who use the power grid (including distributed generation customers) continue to pay for the grid services they use. *As distributed energy resources grow and the role of the distribution grid becomes increasingly important, the ability of the utility to recover the costs associated with providing grid services will become an increasingly significant issue.*

Conclusion

Change is afoot in the electric utility industry – driven by technology, policy, and customers. There are varied opinions on the exact course and timing of the change. Still, many of us would agree that a decade from now the industry will look something like the following:

- We will have a cleaner electricity generation mix, with lower carbon emissions;
- The power grid increasingly will integrate a mix of central and distributed resources;
- The grid will become more digital, more controllable, and more interconnected. PG&E aptly calls this the Grid of Things™;
- A mix of entities – both utilities and other companies – will provide both supply-side and demand-side distributed energy resources; and
- Suppliers – both utilities and others – will offer customers a wide range of individualized and customized services.

Technological change and innovation also requires business innovation. Because electric utilities are trustees of essential infrastructure and service (i.e., the power grid and electricity services), the business model must be sustainable as well as nimble and efficient, and it must be able to earn the support of long-term investors.

Both technology and business innovation require regulators and policymakers to support the transformation underway, including modified cost recovery and pricing mechanisms. Wholesale regulation has changed considerably in the past two decades. Retail regulation must also change to allow utilities the ability to evolve, enabling them to adjust to technological innovations, provide customers more choices, and improve the overall delivery system. *This means – at minimum – adopting regulatory approaches that will lead to the appropriate recovery of the costs of operating, maintaining, and investing in the power grid and providing grid services.*

Collaboration, good public policy, and appropriate regulatory policies are critical for the successful transformation of the regulated electric utility industry. Ultimately, as this transformation unfolds, it is about balancing affordability, reliability, clean energy, and individualized customer services. This is largely the job of regulators and policymakers. But, the ultimate challenge is to make the transformation of the electric utility industry *affordable* to all Americans! And, this is the job of all stakeholders.

Thank you.