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EEI's Annual Conference Preview



THE ROAD TO

# Reinvention

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Electric companies are experiencing seismic change as customers increasingly demand clean energy and redefine their relationships with electricity providers.

**E**XELON UTILITIES, ONE OF THE COUNTRY'S leading distributors of clean energy, is reimagining the mechanics of the modern energy grid to meet these demands, and rethinking the customer experience, to transform electric companies into hubs for connected communities in the 21st century.

Electric power has been an ever-present feature of our lives for over 100 years, even as it generated little to no acclaim.

But its stature is suddenly growing.

The reinvention of the electric system is capturing everyone's attention, from end-use customers to capital markets to Silicon Valley technologists.

It is not hard to understand why, given that this reinvention represents one of the biggest undertakings in human history.

The energy grid of the 20th century helped unleash unprecedented economic growth around the world—growth seen in steel mills, in auto assembly lines, and in the emergence of new and global markets, improving the quality of life in community after community.

The energy grid was such a marvel that the U.S. National Academy of Engineering declared the creation of a national energy grid the greatest engineering achievement of the 20th century. It was the greatest because it made most every other innovation possible—either because electricity is used to make it, or electricity is needed to run it.

But that's history. Our industry now must reinvent and redesign the energy system that fueled the demands of the last century to ensure the success of our economy and support the quality of life and social equity demanded by the 21st century. >>

The world is moving from a mechanically-driven, industrial, and product-focused economy to a digital service economy where the experience, the outcome, and the customer reign supreme. In short, today's customer is more interested in the convenience and flexibility of Uber than owning what is coming off auto assembly lines.

From a fossil-fueled, gritty world, to one fueled by the energy industry's shift to cleaner and more varied energy sources, electric companies are shifting from a low engagement, single-line, "light-and-refrigerator" service, to a physical and economic ecosystem connecting virtually everything that matters in 21st century life, including communications, health care, and mobility.

Significantly, today's customers are shifting their sense of space, mobility, and interaction. Suburban sprawl is giving way to a demographic trend that pulls 70 percent of the population into cities, and one in which the new generation self-selects their sense of community.

***The world is moving from a mechanically-driven, industrial, and product-focused economy to a digital service economy where the experience, the outcome, and the customer reign supreme.***

If the U.S. and its electric companies get this transition right, we can be a model for the world.

Our industry can undoubtedly provide a foundation for this reinvention, but it will require embracing a mandate that goes well beyond delivering safe, reliable, and affordable power—the tenets that guided the industry through the 20th century.

While adhering to these foundational principles, our industry must embrace the additional tenets of being:

- Clean, to mitigate the climate change tsunami;

- Resilient, to adapt to the portion of the wave already upon us, and the expectation that our system will support more and more sectors of the economy with an accompanying lower tolerance for disruption;
- Custom, because 21st century customers insist on having things curated for their individual customer "segments of one;" and,
- Equitable, because our industry was designed to deliver universal service and has steadfastly supported universal access—values that have never been more vital.

The electric power industry has many features that equip it to lead the world's energy reinvention. Our leadership, however, will only be assured if we develop business models that preserve the legacy tenets and deliver simultaneously on these new tenets.

## **The Ultimate Platform**

**FORTUNATELY, OUR INDUSTRY CAN** meet this growing array of responsibilities—to do more and be more to more people—because we have a set of singular capabilities, both technical and social.

Our distinctive technical feature is that the power grid is the ultimate network at a moment when network-powered platforms are the dominant business model of our time.

According to University of California-Berkeley professor Carl Shapiro, "There is a central difference between the old and new economies. The old industrial economy was driven by economies of scale. The new information economy is driven by the economics of networks."

The network effect—in which a business or service becomes more successful the more people use it—explains why 60 of the 100 largest companies on the planet derive half or more of their revenue from platform business models.

Platforms rationalize assets, like Airbnb; act as efficient matchmakers, like eBay; and redefine markets, like Amazon. It is this combination of



**Reinventing our industry requires achieving a new level of resiliency, as we build out an energy grid that supports ever-growing demands with less tolerance for disruption.**

functions, and the platform's ability to scale horizontally and exponentially, that makes this business model so potent.

These platforms are not originating goods; they're creating connections, creating experiences, and acting as clearinghouses for the exchange of services and information. The energy grid is poised to play precisely this role in the reinvention of the electric system.

As more and more uses are made of the energy grid, with resources increasingly controlled outside the industry, there must be a central nervous system that

manages resources, rationalizes assets, and balances competing interests.

As universal service providers, electric companies have the ability to act as a matchmaker: connecting customers to multiple energy solutions and providers, including solar, efficiency services, and devices like smart thermostats.

Our companies can animate, and are animating, new markets—as the energy grid quickly is becoming the hub for the transformation of the transportation sector—with information, infrastructure, and incentives.

# YOU CREATE THE POWER



Exelon Utilities

In addition to the nation's first electric company-operated microgrid cluster in Chicago's Bronzeville neighborhood, ComEd's Community of the Future program includes a five-month seminar introducing high school students to the fundamentals of energy, smart city technologies, and sustainability; and putting them on the path toward science, technology, engineering and math (STEM) careers.

## Beyond Technology

**WHILE THE CHANGING TECHNOLOGY** and business model aspects of our industry are essential components of the 21st century vision of serving customers, technology alone does not solve for all questions posed by the new era or for all tenets required for a successful 21st century electric system. In fact, there is some evidence to suggest that technology without a value context can be alienating. As composer Libby Larsen

wrote, "the great myth of our times is that technology is communication."

In this era of ubiquitous communication, people increasingly are seeking what communication is designed to, but often fails to, deliver: a sense of connection.

In ways other businesses are not, electric companies are physically rooted in the communities we serve. Our industry's assets and people are proximate—indeed embedded—in our communities, where we have both a physical and social connection. As

businesses rooted in “place”, and as participating community members in these places, we are poised to add social context to technology in important ways.

## The Future Vision

**EXELON HAS DEVELOPED A FIVE-**stage maturity model that envisions the evolution of the energy grid’s capabilities from the starting point of fundamental modernization to a future state where the electric company serves as the essential connective tissue for communities taking on the interrelated technical and social challenges of climate change, economic development, and improved quality of life.

Following Exelon’s maturity model, we are working to:

1. Improve reliability by creating a smarter energy grid that can reduce disruptions in a world where more and more sectors of the economy digitize;
2. Ensure that our power system is resilient and secure against potential threats such as cybersecurity attacks, extreme weather events, and, increasingly, the sustained impacts of climate change;
3. Expand customer choice and enable increased adoption of distributed energy technologies such as solar and storage;
4. Support carbon emission reduction policy goals by enabling the electrification of transport, housing, and industry;
5. Partner with cities, towns, neighborhoods and other businesses across industries and sectors to introduce the innovative programs and offerings that will bring truly connected communities to life.

For Exelon, this final step in the maturity model—connected communities—means our companies create places where energy, transportation, and community services intersect with one another to enhance customers’ lives. Our strategic vision is rooted in combining the technological and the social, so the energy grid becomes the key enabler for much of what 21st century communities aim to become.

## Connected Communities

### THIS CONNECTED COMMUNITY

vision is already beginning to take shape across Exelon’s service network.

In the south side Chicago neighborhood of Bronzeville, our local electric company, Commonwealth Edison (ComEd), is developing what might be the world’s first network of microgrids. Two microgrids will be connected by software that will allow for generation dispatch across the microgrids, creating a resiliency-enhancing modular design. One microgrid will be energized in part by solar power shared with Chicago Housing Authority residents.

This microgrid will not only make the system more localized and resilient, it also will serve as the hub for community innovation around the social aspect of electric infrastructure, as we are:

***In ways other businesses are not, electric companies are physically rooted in the communities we serve. Our industry’s assets and people are proximate—indeed embedded—in our communities, where we have both a physical and social connection.***

- Demonstrating electric vehicle ride-sharing as a community mobility solution for seniors;
- Deploying technologies like smart streetlights;
- Installing wind-, solar-, and battery-powered outdoor lighting units where there are no street lights to create safer spaces;
- Establishing community information kiosks;
- Creating a “sharing economy” experience by providing customers with an app that allows them to participate in an energy efficiency program and to share bill savings

with a local school or a faith-based or other community organization;

- Developing educational curriculums for local schools around energy experiments in their own neighborhoods;
- Launching a STEM-based Ideathon competition among local high schools and installing a public art project based on solar cells built by teens in a weekend STEM camp.

Similar connected community concepts are being rolled out through the five other electric companies in Exelon's service network. To date, we have begun partnerships with the city of Annapolis, the Philadelphia Navy Yard, and one of the wards in the District of Columbia. As we build out this new infrastructure—and the services connected to it—we are partnering closely with local communities to create jobs and invest in workforce development to ensure both today's and tomorrow's workers are ready to meet the challenges ahead.

**“Policy is pivotal, and if we are to move through this transformation in a way that adds the most value for the greatest number of communities, we must get the policy right.”**

### The Road to Reinvention

**WHILE ADVANCES IN TECHNOLOGY** are enabling much of the reinvention of the electric system, this is not the ultimate driver of change in our sector.

When it comes to energy innovation, technology leads, but policy rules.

Policy, more than other factor, will set the rules of this transformation.

In the years ahead, decisions made by policymakers and regulators will direct hundreds of billions of dollars in capital investment. This policy will determine the direction of energy grid modernization, the feasibility of

decarbonization goals, and the role of electric companies in shaping the future, technically and socially.

Policy is pivotal, and if we are to move through this transformation in a way that adds the most value for the greatest number of communities, we must get the policy right.

We must also recognize that we are not inventing. We are reinventing. Invention takes intelligence, vision, and drive. Reinvention takes all of that and more.

With reinvention, we don't have the luxury of starting from a whiteboard. Electric companies need to overbuild on top of construction that already exists, while addressing economic interests and renegotiating social expectations deeply embedded in the legacy system.

We need to ensure we don't tug on a critical thread that runs through and thus unravels the existing system before we build the new system.

This is different from the challenges that innovators deal with in other realms of our economy.

Facebook once famously had as its motto, “move fast and break things,” with the idea being that it's okay—even desirable—to radically disrupt the existing order in pursuit of something better.

But electric companies can't take that approach. Our communities can't afford to have their energy grid break down today on the way to this more promising tomorrow.

Even as we expand people's expectations for what an electric company can, and should, be, stakeholders still will hold our industry accountable for doing the three most important things it did in the 20th century: providing safe, reliable, and affordable power.

If we don't get that right, the move to the future is a slow and difficult journey.

Even Silicon Valley is starting to recognize that the ethic of disruption at any cost has costs that stakeholders won't accept when you're reinventing.

In a little noticed move, Facebook recently changed its motto from “move fast and break things” to “move fast on stable infrastructure.”



**Electric companies share aspects of the highly networked, platform-driven business models of the technology sector, but also benefit from being deeply rooted in the communities we serve, as good neighbors and respected employers.**

The reconstructed motto doesn't have the same excitement as the original, but it is a much more accurate reflection of the environment companies with critical legacy infrastructure confront.

Even being mindful of the dynamics of reinvention, electric companies face an imperative to articulate and execute an ambitious vision to reimagine and reinvent a clean, resilient, and connected energy grid that empowers communities everywhere.

Our industry is up to the task. **EP**



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