



Reinventing the Electric Utility

Adapting and Thriving as the Industry Transforms

A Historic Moment in Time

A decade ago, Clareo was engaged with a number of energy and natural resources clients considering future trends. At that time, few industry experts expected electric vehicles and hydraulic fracturing to amount to anything significant. They've all been proven wrong.

The electric utility industry is facing a historic transition. For decades, the industry has been designed to transmit electricity from centralized generation sources to customers across the grid. Today, that model is being upended and the disruption is creating an environment of great uncertainty.¹

With uncertainty, however, comes opportunity.

How do industry players position themselves to prosper in the face of conflicting market signals and changing regulatory policy? And how can incumbents evolve to compete in the new environment?

Clareo's work in the utility and energy industries over the past several years with companies such as Exelon, Johnson Controls and Baker Hughes, offers insights into how companies can adopt new approaches to innovation to succeed in a rapidly changing industry.

An Industry In Transition

New technologies and business models are profoundly impacting today's markets by bringing the production and provision of goods and services closer to the end user. My colleague and Kellogg School of Management professor, Robert Wolcott, has written that the impact of new technologies in aggregate will be to enable us to produce and provide products and services of an increasing variety closer and closer to the moment and at the location demand arises. And companies with foresight will pursue transitional models to be part of driving the change.² The utility industry is a prime example of this trend.

The traditional model of centralized generation and one-way power flows is being challenged by changing customer expectations, new regulatory mandates, and the proliferation of Distributed Energy Resources (DER) – smaller scale power generation and storage that include solar, wind, battery storage, electric vehicles and other resources that reside behind the customer's meter.

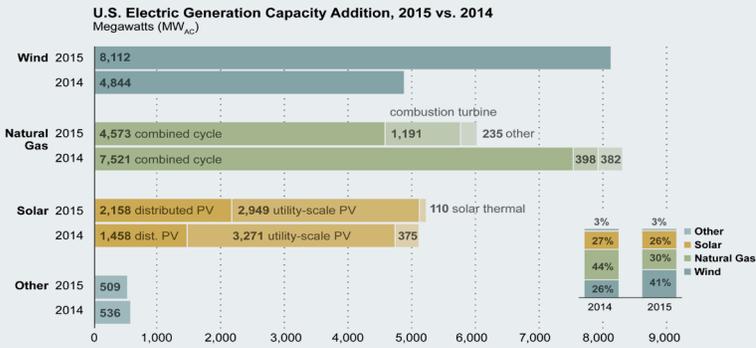
Declining solar systems costs, coupled with incentives and new financing models, have driven down the cost of solar to the point of grid parity in many countries. With rising grid costs and even

further declines in solar system costs, forecasts expect solar to be at grid parity for most U.S. states in a few years, despite low natural gas prices.³

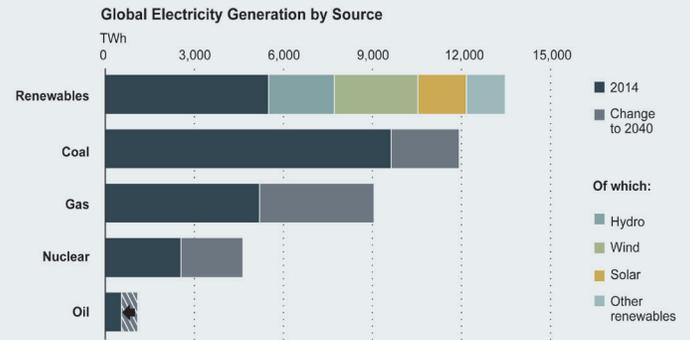
And battery storage technology is expected to increase penetration of renewable energy sources, as storage capacity increases and costs decline with increased production. With lower storage costs, commercial customers may adopt energy storage technologies to help limit peak demand charges. Residential customers may also see incentives to add storage, as solar providers and utilities seek to manage grid stability, given the stresses that intermittent solar energy can place on the grid.⁴

The recent U.S. renewal of federal Investment Tax Credits for renewable energy, coupled with emissions regulations like the Mercury and Air Toxics Standards and the Clean Power Plan (currently put on hold by the U.S. Supreme Court), are also enabling utility-scale and distributed generation units located at end-use customer sites. In the U.S., coal plants are struggling to compete with lower natural gas prices and are now so costly due to the new environmental standards that they are now more costly than new renewable generation.⁵





Source: U.S. Energy Information Administration, 23 March 2016



Source: World Energy Outlook 2015 © OECD/IEA 2015, IEA Publishing

Even with renewable energy incentives and regulations, companies aren't waiting for regulatory mandates before they tap into renewable energy sources. Big names like General Motors, IKEA, Wal-Mart and Kaiser Permanente are voluntarily embracing wind, solar and other clean-energy sources to power their businesses. And it's not just economics motivating these companies, as businesses strive to meet increasingly ambitious corporate sustainability objectives based on internal environmental and clean-energy targets.⁶

Yet despite the rapid rise in renewable energy, coal and natural gas will remain a significant part of the global power generation mix for the foreseeable future, particularly in China and India. While global renewables-based electricity generation increases by some 8,300 TWh (more than half of the increase in total generation, according to the OECD), coal will make up 30% of all global power generation by 2040, down from 41% today.⁷ The

staying power of coal, along with potentially less favorable terms for customers selling renewable electricity back to the grid (net metering), are a few of the many conflicting signals that companies must decipher as they chart their future and develop strategic plans.

Finally, another major transformation is underway with the utility customer. The advent of Smart Meters, which can provide valuable information to customers on their energy use, has created opportunities for new rate structures, demand response (e.g., programs that incent customers to reduce consumption in times of peak demand) and increased customer control over their energy use. Couple that new home energy technology and rising expectations among customers for anytime, anywhere information and utilities are now realizing that their systems and approaches for managing customer relationships need an overhaul if they are to keep their customer base.





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A New Load on Utilities

Utility customers and regulatory bodies are demanding more from electric utilities, including more renewable energy, improved system reliability and resilience, and lower energy costs. Traditional business models built around central power generation, transmission and distribution could be undermined as customers adopt new energy technologies and become more energy self-sufficient. The result could be that renewable energy policies and economics encourage customers to defect from the grid, leaving some utilities and power producers with stranded assets.

This is effectively what happened in Germany. The country's transition from carbon fuels to cleaner energy, coupled with a phasing out of nuclear energy and large subsidies for renewable energy, have caused major losses among utilities and massive write downs of power generation assets. The German utility company E.ON has posted losses of more than €10 billion over the past two years.⁸ Both E.ON and RWE, the first and second largest utilities in Germany, have chosen to spin off their conventional power generation companies and reinvent themselves in order to focus on the growth of renewables as well as decentralization and digitization of the grid.⁹

While the same fate is not as clear for U.S. utilities, their future value in the industry is being challenged on a number of fronts. They will need to explore new business models that will potentially redefine the role and economics of a utility in a world with distributed energy resources. Utilities must explore and deploy new technologies for managing reliability and resiliency of a grid with intermittent renewable energy and for managing the vast amount of information that will become available with Smart Meters. And as new services and options for customers emerge as DER proliferates, utilities will need to become more customer-centric.

With stagnant energy demand from improved energy efficiency and distributed energy resources, many utilities will be facing significant cost pressures. Companies will be forced to re-examine core processes and technologies in the legacy business for step-changes in productivity, using innovation to drive new efficiency gains. These improvements will come through learning and adapting processes and technologies from other industries.



Charting A New Course

In our work with companies facing these challenges, we have identified four areas as key to utilities and other industry players successfully managing this transition:

- Aligning Innovation with Strategy
- Developing Insights for Growth and Efficiency
- Deploying New Methods for Innovation
- Transforming Company Culture



Aligning Innovation with Strategy

Companies must connect their innovation efforts to broader company strategy in order to see strong returns on innovation initiatives. In our work assessing growth and innovation performance at Fortune 500 companies, we find that too often corporate or business unit innovation programs are launched without enough direction provided by a well-articulated strategy, and often lack a clear focus. Well-meaning leaders of innovation teams are given a mission to “innovate,” but without a strong link to the strategy of the company, clear objectives and a prioritized set of focus areas, these programs soon become initiatives in search of a problem and lose credibility among leaders across the business.

At General Electric, both CEO Jeff Immelt and Vice Chair Beth Comstock have been actively

engaged in innovation initiatives and the transformation of the company into a “Digital Industrial” company. Immelt and Comstock make time to meet with innovation teams and take leadership roles in communicating the vision for innovation at GE. At Johnson Controls, Inc., where CMO Kim Metcalf-Kupres oversees innovation at the company, CEO Alex Molinaroli, Metcalf-Kupres, and business unit leaders were involved in shepherding to market a new JCI business for distributed energy storage. This included periodic strategy planning sessions with the team to review progress toward milestones and funding prior to the business’ launch in October 2015. With this type of leadership involvement, we see better alignment between strategy and innovation initiatives, more effective use of resources to launch new businesses for growth and ultimately a great chance of success.



Developing Insights for Growth And Efficiency

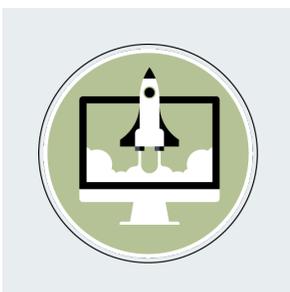
Many established companies struggle to generate sufficient insights from new trends and forces to guide both strategic planning and innovation initiatives. This is particularly true in the electricity utility industry, where changing regulatory regimes, disruptive technologies and evolving customer expectations are placing new pressure on utilities to better understand how these trends may impact their business viability. And as with many other industries, there are the societal concerns of a broader set of stakeholders beyond the utilities' shareholders that must be considered.

Traditional desk research and internal analysis to better understand trends and spot opportunities for growth or threats are still critically important, but they tend to be an inside-out view of the world from the company's perspective and can suffer from confirmation bias. In today's dynamic energy industry, companies must also draw on other methods for generating insights for both growth and efficiency improvements.

Working with several investor-owned utilities to explore topics ranging from the "Utility of the Future" to "Customer of the Future" to "Distributed Energy Resources," we have helped teams take a different approach to collecting insights, an outside-in method to better inform executives' understanding of the trends in those areas, the pace of change and implications for their business.

For that program, Clareo designed immersive experiences for teams to learn from the perspectives of trend-setting customers, leading technology firms, top venture capitalists, academics and other thought leaders both from within and outside the industry. These meetings were held at off-site locations and included tours of facilities and technology demonstrations. For these executives, the most meaningful insights and powerful messages came not from the desk research, but from the conversations team members had with customers, venture capitalists and other individuals on the front lines of industry change. These insights have led to ideas for new businesses, innovative ways to reposition the company in the industry and respond to threats, and initiatives to better engage a broader set of stakeholders who will play a big role in the company's future success.

Beyond growth and business transformation initiatives, new approaches to gathering insights can also be leveraged for efficiency gains in the core business. We have helped clients develop new market sensing and technology scouting capabilities, including corporate venturing, to identify applications for new technologies and processes in clients' core business. One example is the growing application of data analytics and sensors in the industry to optimize asset utilization, monitor grid performance and gather insights for deepening customer relationships.



Deploying New Methods for Innovation

Utilities have optimized their organizational structures and business processes around a business model that is decades old and under significant stress. For utilities to evolve and ultimately thrive in the face of today's new technologies, market shifts and regulatory regimes, they will need to adopt approaches and structures that encourage and support innovation. This is the innovation paradox in the utility industry – pursuing efficiency and optimization in the core business while simultaneously managing the transition to new business models and adopting innovative new technologies.

Some companies concluded that a dedicated function for innovation is necessary to guide major innovation initiatives, develop and disseminate innovation methods and tools, and foster a culture of innovation across the company. Clareo advised a major utility company on development of such a function, arranging dialogues with companies to benchmark and adopt leading-edge innovation practices that fit with the utility's strategic objectives and industry context.

Based on that, an innovation methodology with supporting processes and tools was developed

for the company. The objective was to develop capabilities for sensing and scouting, and enable rapid experimentation and validation of new ideas, business models and technologies in environments of uncertainty, tasks that are typically “unnatural” for existing businesses and thus difficult to execute.

One effective approach to address this challenge is to establish a “home” for promising new growth opportunities, such as a new business incubator. Teams in the incubator receive support and training on startup methodology, including how to rapidly and externally test hypotheses to resolve market and technology uncertainties. Funding for startup teams is governed by learning plans and milestones, rather than typical stage-gate processes designed for well-known markets and technologies. Following this approach, one company successfully launched a new business in the high-growth market for energy storage with

executive support and funding, a clear plan and reference customers in key targeted segments.

Utilities must also become adept at ecosystem mapping and strategies, a method we have used with dozens of clients to better understand strengths, weaknesses and opportunities across a broader set of stakeholders and to develop a compelling vision for their industry. Rather than wait for the future role of utilities to be defined by others, utilities should be developing a vision of future for industry stakeholders and be proactively selling that vision and its benefits to the ecosystem. This includes articulating a consistent, positive message around the value of an affordable, resilient and reliable electric grid and a vision for the role of utilities in the new world of DER, amongst a diverse set of stakeholders that includes customers, regulators, politicians, environmentalists, the media, supplier partners, industry trade groups and standards setting organizations and others.



Transforming Company Culture

Finally, utilities need to establish a corporate culture that encourages and empowers employees to pursue innovation initiatives.

For example, energy company Exelon hosts an annual Innovation Expo, designed specifically to foster a culture of innovation across the enterprise. The Expo, which was modeled after other corporate innovation forums such as 3M’s poster contest and adapted for Exelon’s context as a diverse energy company, includes an innovation project contest, where employees are encouraged to share ideas and learnings from innovation projects across the company, and a session where employees learn

from leading innovators both within and outside the energy industry.

The company has also prioritized innovation by developing an innovation index to measure performance on a number of factors. One such measurement is performance on a cloud-based, all-employee Innovation Assessment, which tracks innovation performance relative to leadership, organization, learning, process, capabilities and culture. The survey gives company leadership insight into employee perspectives across operating units, functions, job levels and age groups, helping to address gaps and identify opportunities for improvement.

The Future of Power

For utilities, adapting and thriving in the new world of renewable energy mandates and distributed energy resources will require new capabilities and approaches. Innovation is not an option, but a requirement. For companies that have fine-tuned their operations to optimize the core business, this is often a challenging journey.

Despite the multitude of challenges facing utilities today, leading companies are proving that a disciplined approach to innovation, with strategic insights, a core set of methods, and a supportive company culture, can light the way to the future of power.

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About Clareo

At Clareo our mission is to help businesses adapt and grow.

We help leaders adapt their businesses and create new ways to grow in rapidly changing markets. Together, we build the plans and capabilities that deliver results. We assist clients in improving strategy execution, finding radical efficiency gains, developing entrepreneurial capabilities, taking new ideas to market, exploring plausible futures, and investing in business ecosystems.

Our clients choose Clareo when they want bold new ideas fueled by a network of leading experts. Working alongside our clients, we create compelling strategies that lead to action.

To find out more about Clareo, visit www.clareo.com.

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