Tale of Two Grids

What a review of PUC cases tells us about the future of consumer technology and grid modernization.

BY CAMERON BROOKS
According to figures reported by the Energy Information Agency last month, annual electricity sales fell by over one percent in 2015. For the fifth time in the last eight years, electricity sales have declined, establishing a trend that is fueled, in addition to changes in the manufacturing sector, by consumer technologies that allow increasing energy efficiency and generation. Bloomberg recently estimated that power generators in the country may face a revenue shortfall of two billion dollars due to the fact that nearly one million homes with rooftop solar are generating substantial amounts of their own power.

These statistics are emblematic of the fact that consumers today have access to technologies that can fundamentally change their energy profile. LED lighting that reduces energy use by an order of magnitude, distributed generation that allows consumers to send power into the distribution grid, and energy management systems embedded in thermostats and other household devices are now ubiquitous. In short, it seems that complete grid defection is not required to have a dramatic impact on the core assumptions underlying today’s utility business model, most notably increasing load growth.

Against this backdrop of technology innovation, regulators are grappling with questions of grid modernization in various proceedings currently active before the state public utility commissions. As measured by revenue, approximately eighty percent of the nation’s electricity is provided by investor-owned entities operating in markets primarily regulated by state commissions. (The balance is provided by public entities, typically governed by city councils, appointed boards or elected cooperative members.) These commissions, comprised of a mere two hundred individual commissioners across the country, dominate and in large part define the industry.

We regularly monitor the activities of the state commissions. Many states have opened high-profile proceedings that explicitly address market transformation and investment frameworks for grid modernization. New York’s Reforming the Energy Vision initiative calls for a fundamental market realignment to prioritize distributed energy and market-based approaches. Over the past several years, Massachusetts has led a grid modernization effort requiring utility proposals for advanced metering, time-varying rates and voltage optimization, but stops short of the market restructuring sought by their western neighbor. At least a dozen other states have major initiatives underway, including California, Colorado, Minnesota and the District of Columbia.

But without using the moniker of grid modernization, at least as many states or more are considering policies and programs that have major implications for the role of consumer technologies going forward. While residential solar and net metering receive the most attention and garner dramatic headlines, the state public utility commissions are facing a wide range of issues that relate to how to design rates, investments in distribution infrastructure and incorporating consumer technologies into existing programs and market designs.

We recently completed a review of over twenty five hundred active proceedings across the country with a focus on rate design, distributed energy policy, access to information and other dimensions of grid modernization. Nationwide, commissions are considering frameworks for using intelligent thermostats for demand response, determining the value of solar and storage technologies, engaging in distributed resource planning, providing smart meter information to consumers so they can take advantage of energy analytics, and many other applications and policies that are directly relevant to how the grid will be transformed. Our findings provide a framework for understanding the state of the states.

In conducting our survey, we looked at both the measures included in scope of the proceedings and the overall policy framework within the state itself. When looking at regulatory

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proceedings, we identified key measures designed to influence grid modernization, such as customer engagement, data access, load management, distributed energy resources policy, community ownership, rate design, local system value and voltage management. We also reviewed the states’ policy environment, based on past or ongoing state policy initiatives, legislation, requirements or agency activities that may affect grid modernization.

Our analysis found a high correlation between states with restructured markets and strong policy orientations, by which we mean those states with comprehensive policy mandates across several areas, including energy efficiency, renewable energy, smart grid deployment and other areas. Perhaps this is not surprising, since those states that have already embarked on market reforms are most likely to continue to pursue other policy changes. But there may be a more fundamental schism worth noting that raises fundamental questions about the role of the distribution utility and the footprint of the natural monopoly.

It is “A Tale of Two Grids.” One the one hand, there are states where the policy is moving toward more open market solutions, including community ownership, community choice models, auction mechanisms. In these states, we see more attention toward policies around consumer data and bring-your-own-device programs that welcome consumer-owned devices like intelligent thermostats. In these states, the discussion often focuses on the platform role for the distribution company, enabling market activities.

On the other hand, there are states that are more inclined toward expanding the vertical integration model. These states have responded favorably toward proposals that include utility ownership of distributed energy, such as rooftop solar, and increasing traditional demand-side management and direct load control programs with prescribed technologies.

Perhaps the most talked about example of a state initiative to establish open markets based on a platform model is the Reforming the Energy Vision, REV, proceeding established by the New York Public Service Commission in 2014. From its inception, the REV proceeding has been notable for its core tenets of prioritizing distributed energy technologies and seeking to achieve “market animation.” The initial Staff Report said:

“Addressing these challenges and opportunities involves questioning two assumptions of the traditional paradigm: that there is little or no role for customers to play in addressing system needs, except in times of emergency; and that the centralized generation and bulk transmission model is invariably cost effective, due to economies of scale.”

No other state has so explicitly or comprehensively attempted to restructure its current market design, but there are certainly other examples of state efforts to establish market mechanisms that are more open to new entrants. California, for example, spent several years reshaping its demand response programs in order to allow aggregated demand response to be procured by utilities through its wholesale markets. Last year, the utilities in the state held the first demand response auction. In a related move last month, the California ISO filed a proposed tariff with the Federal Energy Regulatory Commission to allow aggregated distributed energy resources to participate in energy and ancillary services markets.

In Illinois, consumer and environmental advocates petitioned the Illinois Commerce Commission to establish an “Open Data Access Framework” that would allow consumers to take full advantage of the detailed information available from smart meters. Nearly half of the country is now served by smart meters capable of providing detail historical and real-time information, but in most states outside of California and Texas, consumers don’t have a way to share that information with service providers that can help them disaggregate their usage profile or integrate that information with other smart devices in their home.

While the proceeding is still ongoing, the Commission issued an interim decision last month establishing the process by which customer can grant access to their information. These are just a few examples of state action promoting open market frameworks and that favor a platform model.

In contrast, regulators in Florida approved a three-year pilot program whereby Florida Power and Light will offer customers the opportunity to contribute to the construction and operation of solar photovoltaic systems throughout FPL territory that are owned by the utility. Similarly, regulators in Arizona have approved programs that allow the utilities to install and own solar system on customer premises.

The new capabilities available in the consumer marketplace raise important questions about the future role of the distribution grid operator. In response, utility proposals represent fundamentally different (perhaps conflicting) visions of the natural monopoly and the role of the utility. The incoming NARUC president, Travis Kavulla, posed a poignant question to his
Resources Plans” from each of the three major utilities. Similarly, New York has required “Distribution System Implementation Plans” that will be filed this summer. Minnesota, through its c21 Initiative, has called for a similar planning process, though no concrete directives have yet emerged. Understanding the basic contours of the distribution grid seems like vital information to guide any policy making effort, but especially critical given the advent of new technologies and the capacity for customers to dramatically influence grid operations.

State commissions are consistently called upon to manage the ongoing tension between the benefits of market systems and the perceived security of regulation. Many economists note that advances in technological capability, such as we see in consumer technologies, will reduce transactions costs and therefore should shrink the footprint of the natural monopoly. And yet, it is also true that there is an understandable amount of apprehension surrounding the idea that the largely command-and-control distribution system oriented around reliability would suddenly have a wide spectrum of owners and operators, from individual homeowners to community-scale projects to national players.

Our analysis of ongoing proceedings before the commissions, too lengthy to reproduce in these pages, suggests that the immediate future will not involve a unified migration toward a new regulatory model, but is more likely to involve movement toward two distinct models. Either way, the “Tale of Two Grids” will be authored at the state level where the regulatory landscape is ultimately defined.

Letters to the Editor

(Cont. from p. 7)

The column’s author is correct, that how FERC handles these complaints will “speak volumes” about the direction of regulation. Competitive suppliers invest shareholder dollars at considerable risk to bring to life the competitive framework Congress expanded in 1992 and which Ohio adopted in 1999. Market participants rely on FERC at the federal level and the PUCO at the state level to make decisions consistent with those legislative directives to inject competition into electricity.

Ohio and twelve other states, plus the District of Columbia, voluntarily opted into PJM in order to let their consumers share in the benefits of a wide geographic footprint. Many of those states, including Ohio, also restructured to separate generation from distribution. Whenever any state improperly interferes with the interstate market, whether Maryland, New Jersey or now Ohio, it is incumbent upon FERC and the federal courts to step in. That is not declaring war on anybody.

As the column’s author conceded, the integrity of wholesale markets is “squarely within FERC’s wheelhouse.” Hopefully FERC has grabbed or will soon grab that wheel and do the right thing. The future of competitive wholesale markets depends on it.

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