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Policy note

Recent developments in competition and innovation for regulated electric utilities

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1. Introduction

The electric utility industry is currently undergoing substantial evolution. Recent technological advancements, as well as changing customer demands, are expanding the number and type of electric utility grid services and product offerings to end-use customers. Furthermore, these forces, as well as societal and economic shifts, are presenting regulated electric utilities with new market development opportunities (Cross-Call et al., 2018). Even the definition of the regulated electric utility's "customer" is evolving by expanding beyond the traditional end-user of electricity to include third-party businesses engaging with the utility in order to more successfully sell their own services and products.

Evolution in this context refers to new or different ways in which customers receive utility services and products or utilities pursue broader market opportunities, which themselves may result in new or improved service or product offerings. These developments, however, are not affecting all utilities uniformly. Nor do all stakeholders and policymakers support them unequivocally. The wide range of views illustrates the profound implications for critical issues related to competition and innovation.

2. Major evolutionary developments

This policy note highlights four recent evolutionary developments in grid services, products, and market opportunities based on an analysis of a representative database of more than 50 recent regulatory filings by electric utilities as well as major legislation pertaining to electric utilities. Data collection occurred over a six-month period (June to November 2017) and focused on reviewing activities promulgated by or affecting regulated investor-owned electric utilities,[1] including public filings in state utility regulatory proceedings, legislative statutes, and utility reports, websites, and presentations to better understand the specifics of the changes being proposed or instituted. We surveyed materials from 28 states and Washington, D.C., with the highest frequency of items from New York and California (see Fig. 1).

This assessment is limited to activities that occurred within the last two to three years, with an emphasis on those that were initiated or culminated in 2017. Therefore, our findings should be considered a *snapshot* of how the regulated electric utility industry is evolving in terms of services, products, and market opportunities. We focus on the following four developments:

- Default time-of-use (TOU) pricing for residential customers
- Distributed generation compensation reforms
- Procurement approaches for non-wires alternatives
- Utility investment in electric vehicle charging infrastructure

2.1. Default time-of-use pricing for residential customers

Reforms in retail pricing are changing the ways in which residential customers pay for grid services and products (see Table 1). A handful of states (e.g., California and Massachusetts) committed to moving all of their residential customers onto default TOU rates in the coming years, while a few other states will consider transitioning in this direction in current or future regulatory proceedings (e.g., Colorado and New York). At the same time, a number of states and utilities are pursuing innovative pricing pilots (e.g., all IOUs in California and Xcel in Colorado and Minnesota) to better understand customer acceptance, retention, and response with regard to default rates.

The trend toward residential TOU rates, especially as the default, is driven forward by perceived efficiency benefits. The business case for advanced metering infrastructure (AMI) frequently included the substantial benefits from greater penetration of residential time-varying rates, including TOU (NETL, 2008). With over half of the existing advanced meters on U.S. households installed between 2012 and 2016 (Institute for Electric Innovation, 2017), regulators and policymakers are now encouraging utilities to capture these benefits for their ratepayers. Moving customers to TOU creates opportunities for greater economic efficiency by exposing customers to prices that better reflect

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[1] In some cases, municipal and cooperative utilities have made evolutions similar to their regulated investor-owned utility (IOU) counterparts. However, this report is focused on recent efforts by IOUs.

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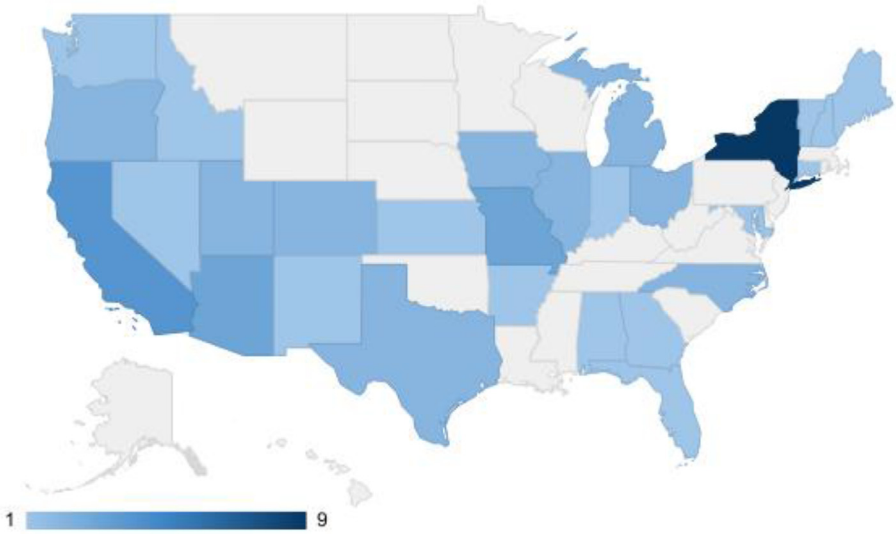

Fig. 1. State-by-state coverage of regulatory filings and legislation surveyed in analysis.

Table 1
Sample of residential TOU pricing trends.

State	Docket/Legislation	Description
AR	16–052-U	Residential and general service TOU & demand charge rates (OG&E)
CA	R.12-06-013	Residential default TOU rates and supporting pilots (all IOUs)
CO	17M-0204E	Residential voluntary/default TOU & demand charge rates (all IOUs)
HI	2014–0192	Residential TOU rate pilots (all IOUs)
MA	14-04-C	Residential default TOU rates for distribution costs only (all IOUs)
MD	PC-44	Residential TOU rate pilots (all IOUs)
MN	E002/M-17-775	Residential TOU rate pilot (Xcel Energy)
NY	14-M-0101	Residential and small commercial voluntary/default TOU rates (all IOUs)
OH	17-1234-EL-ATA	Residential TOU rate (Ohio Power Company)

the marginal cost of electricity. In turn, this should drive investment in enabling technologies that not only allow customers to more easily adapt to the TOU rate thereby better managing their overall bills but also to more readily participate in other programs that allow grid services to be sold to the utility (MADPU, 2014.)

A number of stakeholder groups have raised several concerns about TOU rate reforms. Consumer advocates contend that TOU rates could be considered to have a regressive impact on low-income customers who generally use less electricity than the average customer and find it more difficult to make behavioral changes or invest in control or other technologies to reduce consumption during the more expensive on-peak period (Cappers et al., 2016). They also raise concerns that TOU rates could increase average bills and bill volatility (Alexander, 2010). Consumer awareness about total monthly usage, peak demands, and period usage, for example, is likely very limited, which may further create challenges for transitioning customers to TOU rates (Faruqui et al., 2010).

2.2. Distributed generation compensation reforms

Numerous states and utilities have recently made changes to the method for compensating distributed generation (DG) resources for exported electricity (see Table 2). The dominant form of compensation for DG in the U.S. has historically been net-energy metering (NEM), which essentially allows DG customers to generate credits for exported electricity and bank them for future use (typically subject to annual reconciliation) all valued at the customer's full retail rate. According to the database developed for this analysis, at least 11 states had approved some form of compensation for exported DG output as either a reform to NEM or as a successor tariff. Another handful of states (e.g., Arkansas, Louisiana, and Texas) had pending decisions on DG compensation reforms and even more states were assessing the costs and benefits of DG to inform potential reforms. DG compensation reforms have largely focused on altering the energy (¢ per kWh) rate paid by the utility for exported customer DG output-based on either an avoided-cost rate (e.g., Arizona), wholesale energy rate (e.g., Indiana), or some administratively-determined percentage of the retail energy rate (e.g., Nevada and Utah). DG compensation reforms may also be subsumed as part of broader retail rate modifications, such as increased fixed customer charges or three-part residential rate design (i.e., imposing a demand charge), but limit our discussion herein to rate policies specific to compensating the exported electricity of DG systems (see Table 2).

DG compensation reforms are primarily driven forward by the objectives of fairly and equitably incentivizing technology adoption without driving significant cross-subsidization and, to a lesser extent, interests in reflecting DG-specific value streams. As a related motivation, regulators and consumer advocates note potential cost shifting from participating customers (i.e., DG owners) to non-participating customers, which can be mitigated or resolved entirely with DG compensation reforms (Barbose, 2017; CPUC, 2013). Many utilities view the dramatic growth in distributed solar photovoltaic (PV) installations in some states (e.g., Nevada, California, and Arizona) as evidence that incentive policies, such as conventional NEM, are no longer warranted (EEI, 2016).

In addition, some utilities are reaching pre-specified caps on the amount of DG capacity enrolled in NEM, thereby forcing policymakers to determine successor tariffs (NCCETC, 2017). DG providers are also supporting the determination of resource locational value (e.g., the avoided marginal cost of capacity) and using this feeder-level information as the basis for new compensation schemes (Gahl et al., 2018).

Solar advocates and providers are concerned about the inconsistent application of DG compensation methodologies across utilities and states, and the frequency of changes to compensation levels that may create uncertainty for customer investment decisions and hinder the development of a robust DG market (SEIA, 2017). Also, implicit competition among DG and other DERs may reduce the current and future value of particular resources and may depend on the nature of their integration and interactive effects. For example, distributed solar PV