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This work was supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, Office of Strategic Programs, under Contract No. DE-AC02-05CH11231. The authors would particularly like to thank DOE's Ookie Ma for his support of this project. The authors acknowledge the contributions of Lisa Schwartz and Emily Martin Fadrhonc to a technical report that serves as the basis for this article.

A Framework for Organizing Electric Utility Regulatory and Business Models

Many regulators, utilities and industry stakeholders are reevaluating regulatory models and the implications for electric utilities in the context of today's environment of increasing distributed energy resources, advancing customer technologies and relatively flat utility sales. This article presents a framework to represent the broad spectrum of regulatory and utility business models that exist today and may develop in the future.

Andrew Satchwell and Peter Cappers

I. Introduction

At present, there are a number of trends confronting electric utilities shaping the regulatory and business environment, and will in some cases accelerate change in the electric industry. For example, energy efficiency (EE) programs funded by electric utility customers, EE standards for appliances and equipment, and more efficient building codes for new construction and major renovations are likely to continue to offset the majority of the forecasted electric load growth. Projected incremental annual savings from customer-funded EE programs are expected to reach about 0.8 percent per year by 2025 driven primarily by compliance with statewide savings or spending targets (Barbose et al., 2013). Costs of distributed energy technologies are also declining steadily and may soon be

 1040-6190/ http://dx.doi.org/10.1016/j.tej.2015.09.009

competitive with retail rates in several states (Barbose et al., 2014; Bronski et al., 2014). As of year-end 2013, electricity generation from customer-sited PV in the United States (U.S.) was equivalent to 0.2 percent of total U.S. power production with projected residential and commercial PV penetration reaching almost 0.8 percent of U.S. retail sales by 2017 (GTM/SEIA, 2014). Taken all together, consumers, as well as third-party investments in energy efficiency EE and customer-sited generation, such as distributed energy resources (DERs),[1] are contributing in some jurisdictions to stagnant, or even declining, electricity sales. The Energy Information Administration (EIA) Reference Case forecasts retail electric sales growth of 0.8 percent per year from 2013 to 2040 (EIA, 2015).

Reductions in growth rates of retail sales will likely have implications for the bottom line of many regulated electric utilities. Retail rates are often designed today to collect large portions of fixed costs in volumetric charges (i.e., $/kWh, $/kW). When sales decline, revenues drop without equivalent reductions in costs resulting in the potential for earnings erosion between rate cases (Eto et al., 1994). Because of this, utilities increasingly view DERs as a threat to their financial stability making the pursuit of more aggressive DER penetration goals not well aligned with their business interests.

In addition, many utilities are facing the prospects of large capital investments in transmission and especially distribution (T&D) system upgrades. According to the Edison Foundation, total distribution costs at a national level for the period of 2010 to 2030 are forecasted to be $582 billion in nominal terms (Edison Foundation, 2008). In New York State, the Department of Public Service is forecasting investments of $30 billion over the next 10 years (NYS Department of Public Service Staff, 2014).

Retail rates are often designed today to collect large portions of fixed costs in volumetric charges.

Many regulators, utilities, customer groups, and other stakeholders are reevaluating existing regulatory models and the roles and financial implications for electric utilities in the context of today's environment of increasing distributed energy resource penetrations, forecasts of significant T&D investment, and relatively flat or negative utility sales growth. When this is coupled with predictions about fewer grid-connected customers (i.e., customer defection), there is growing concern about the potential for serious negative impacts on the regulated utility business model. Among states engaged in these issues, the range of topics under consideration is broad. Most of these states are considering whether approaches that have been applied historically to mitigate the impacts of previous ''disruptions'' to the regulated utility business model (e.g., energy efficiency) as well as to align utility financial interests with increased adoption of such ''disruptive technologies'' (e.g., shareholder incentive mechanisms, lost revenue mechanisms) are appropriate and effective in the present context. A handful of states are presently considering more fundamental changes to regulatory models and the role of regulated utilities in the ownership, management, and operation of electric delivery systems (e.g., New York ''Reforming the Energy Vision'' proceeding).

The proposed fundamental changes and future electric utility regulatory models have, to date, been presented conceptually across many studies, papers, and other documents (Eto et al., 1994; Moskovitz et al., 2000; Nimmons and Taylor, 2008; Cappers et al., 2009; Fox-Penner, 2010; Satchwell et al., 2011, 2014; Lacy et al., 2012; Aggarwal and Harvey, 2013; Hanelt, 2013; Kind, 2013; Lehr, 2013; Newcomb et al., 2013a,b;

 1040-6190/ http://dx.doi.org/10.1016/j.tej.2015.09.009