The Old Order Changeth: Rewarding Utilities for Performance, Not Capital Investment

Scudder Parker, Vermont Energy Investment Corporation
Jim Lazar, The Regulatory Assistance Project

ABSTRACT

It is time for jurisdictions serious about moving to a new utility model to transition from a rate-of-return structure to direct performance regulation. It will help utilities move to cleaner energy, energy efficiency, and their corollaries: customer-friendly and environmentally responsible service. Decoupling has reduced some barriers to pursuing efficiency, combined heat and power (CHP), and net metering. Although efficiency programs generally operate under some form of separate regulated performance structure, utilities still operate under traditional capital asset cost recovery regulation. As technologies and customer needs change, distribution utilities need to integrate new distributed resources into their supply mix by working in transparent partnership with customers and markets. This seismic shift will require a break from older models. It will require clear articulation of policy objectives by legislative and regulatory leaders, an active partnership in implementing, and an active learning process to translate those objectives into indicators that guide strong performance.

The authors outline a process that can help effect an intelligent transition. They address necessary preconditions for bringing it about. They discuss three essential tiers of utility performance incentives: (1) "guiding" incentives that set long-term goals and foster integration and coordination of services; (2) "directional" incentives, correlated to the guiding incentives, and (3) "operational" incentives, to assure customer service and reliability. The paper proposes three potential guiding incentives. It discusses how directional incentives could accelerate new capacity building for utilities, and how operational incentives can progressively improve customer service. High performance can result in increased utility effective rates of return.

Introduction

The *utility of the future* is now a buzzword in the utility industry. The term has been interpreted in many different ways but the essentials are simple: The dominant business model that has guided electric utilities is not facilitating the policy and technology changes that offer new, economically viable ways of operating in an increasingly diverse technology market.

It has long been recognized that the current framework of utility regulation—in which the utility's revenue is a function of its rate base (investment), multiplied by an allowed rate of return, plus recovery of prudently incurred operating expenses—is fundamentally flawed. It produces an incentive to invest, not an incentive to minimize costs or maximize value (Averch and Johnson 1962). Although evolving public policy has given the utility sector new missions, and changes in technology have given the utility sector (and customers) new tools, the basic framework of regulation remains largely unchanged.

It is tempting to respond to technology changes with "magical market thinking." But such an approach can open utilities and customers to new risks as regulatory protections are dismissed and technologies evolve and mature. "Markets" are simply too crude a tool to reach millions of

end use consumers whose electricity consumption amounts to only a small percent of their annual incomes.[1] Important roles exist for utilities and regulators, and for efficiency programs that offer strategic market intervention to overcome market barriers to efficiency. We need to shift our thinking to match the enormous shift that customers, technology players, and regulators are making, particularly as climate change increasingly drives us forward. Finding the pathway to a utility of the future that moves from providing electricity as a commodity to a structure that offers more sustainable energy security is the key. This can happen only if regulators and the industry directly connect revenue requirements and earnings to performance, not to expenditures.

We call this *performance-based regulation* (PBR; Lazar 2014). A PBR structure is something that could motivate utilities to move closer to becoming a utility of the future that serves customers equitably, meets their energy needs, and contributes to energy security. Lazar reiterates the longstanding position of the Regulatory Assistance Project (RAP): "…'all regulation is incentive regulation,' meaning that every framework for utility regulation provides incentives for specific behavior or specific outcomes, and those incentives guide behavior." (Lazar, 2014). This means, of course, that the default design of most regulated utility systems rewards capital investment and generally fails to put a premium on innovation and the development of services that offer long-term benefits.

The utility-of-the-future debate is dominated—if not clouded—by discussion of the functions the utility might perform, the services it might (or might not) offer, and how it would interact with new, market-based energy services. Of course, we must address these topics. But the debate often avoids the essential discussion of what regulatory incentive structure can guide incumbent utilities from "here to there." So, what is the pathway to incentivizing active engagement by utilities? Avoiding potential unintended consequences? Avoiding serious quality-of-service and reliability problems? Avoiding new forms of social inequity? And ensuring underlying financial viability?

There will have to be a transition, and it will have to involve enhancing customer empowerment and societal equity, and an improved environment. A dynamic, intelligent reward structure for utilities is critical to that process. This paper draws a roadmap for jurisdictions moving toward clean and equitable energy services to utility customers in a new era of technological opportunity and environmental urgency. We address the following topics:

1. The "next utility" structure and its incentive design should be informed by clearly articulated policy goals that guide the highest levels of decision-making.
2. The policy and regulatory framework must inform a new, emerging partnership between regulators and utilities, built on a shared vision of effective innovation and performance.
3. Solid implementation experience—in deep energy efficiency and "least-cost planning and procurement"—offers the right kind of platform for building a sound incentive structure for guiding "next utility" success.
4. For policy makers, a commitment to and experience with some form of revenue cap regulation should underlie the guidance on new incentive structures to utilities.

[1] Classical economics supports the notion that competition in markets leads to operational efficiency. But this occurs only when preconditions to efficiency under competition are met, such as goods that are a perfect substitute, perfect information on behalf of producers and consumers, free entry and exit, and fungible capital. None of these assumptions is present in the electricity industry, which is capital intensive with capital invested in specialized equipment. Electric utilities frequently act like natural monopolies, and are subject to being eroded by new entrants.

5. The process should be transparent, and sufficiently dynamic to welcome new forms of distributed resources and customer empowerment, but thoughtful about enhancing the underlying value of the distribution system.
6. Policy makers should outline a new performance structure early, and plan for incremental implementation. But they should also anticipate appropriate adjustments in response to well-structured feedback and assessment mechanisms.
7. Some jurisdictions will be able to use "collaborative" models to guide implementation of performance regulation through a shared, ongoing process.

The Role of Policy Goals in Allowing the Next Utility to Emerge

There is a practical value to articulating clear policy goals at the legislative and regulatory levels. Those goals will guide a wide range of planning and implementation actions over time. However obvious this may seem, it is not at all standard practice. Active policy guidance allows clear discussion and direct, efficient debate as implementation proceeds. If policy makers do not articulate an overarching policy direction, every decision about implementation becomes *both* an implementation discussion *and* a policy discussion. This leads to confusion, inefficiency, and potentially, paralysis.

As a positive example, Hawaii has a goal of achieving renewable energy production equal to 100 percent of its utility sales by 2045. This goal helps Hawaiian policy makers and utilities frame discussions of renewable energy as a matter of "how to," not "what if?" Decisions about how to integrate solar, efficiency, strategic electrification, storage, and demand response in Hawaii must be about successful integration and cost control, not about *whether* they should be pursued, or "how hard this will be to do." The path to effective integration is not obvious (nobody has done this, yet!) and it will be contentious. But the evolution from current rate-of-return utility incentive regulation to regulation based on the utility's performance in achieving defined goals has solid justification in policy. Active regulatory oversight and clearly expressed overarching policy that guides participation will be essential to effective transition into the "next utility" era.

Many of the policy goals guiding utility-of-the-future regulation are already in place in some jurisdictions. Such goals involve (1) securing all cost-effective efficiency; (2) actively addressing climate change; (3) decreasing risk and enhancing reliability by diversifying energy sources; (4) empowering and mobilizing customers and market actors by supporting distributed resource deployment; (5) providing economic and social equity, and health benefits; and (6) consistently considering "least-cost" energy use in all sectors (transportation and delivered fossil fuels, as well as electricity; and coordination with natural gas service).

Nevertheless, translating broad policy goals into practice takes time. Rhode Island passed its Least Cost Procurement legislation in 2006. The legislation led at first to a slow increase in the procurement of energy efficiency, but then the ramp-up was remarkable. Rhode Island did not pass legislation until 2010 that directed a revenue cap or "revenue decoupling" mechanism. That passage accelerated the pace of energy efficiency implementation. In 2015, the Rhode Island Collaborative (with the assistance of the Office of Energy Resources, National Grid, and the state's Energy Efficiency and Resource Management Council) created the Systems Integration Rhode Island (SIRI) group. It considers strategic electrification, demand response, the integration of least-cost principles into distribution system planning, and performance regulation for the utility (SIRI 2016). This emerging "system wide" discussion of future utility roles grows out of a strong collaborative approach to energy efficiency planning and

implementation that has expanded to include (for instance) consideration of how utility distribution system planning should respond to distributed resource development more broadly.

A Different Relationship (Partnership?) between Regulators and Utilities

One of the "advantages" of the current rate of return regulatory model is that it is at least familiar to regulators and utilities in terms of their expected roles. There are, of course, wide variations in the relative strength of regulators and utilities, and divergent perceptions of how "proactive" or "consumer-focused" regulators should be. There is also a familiarity in financial markets with "utility regulation" that offers a level of confidence for investors.

Abandoning rate-of-return regulation and adopting performance regulation has risks:

- Regulators won't know how to do it, and will have to think, investigate, and regulate in a new way to do it well. Risk of both over-regulation and under-regulation is significant.
- Utilities will strongly resist, and will try to game a new system to their advantage.
- Markets will perceive new risks and perceive higher investment risk.

These challenges are real, but they need to be understood in the current context. Utility markets are already changing. Climate change and new technologies are factors in issues of prudent investment, recoverability of costs, and whether customers will leave the system.

In effect, we are now asking explicitly that utilities facilitate expanded customer and market investment in meeting our energy needs. Regulators need to recognize that this is a new role for utilities, and respect that new risks will necessitate new skills and capabilities. Deliberate and thoughtful progress toward such a new partnership can create some new opportunities for utilities (electrification of the transportation sector). In can also create new investor confidence.

The Importance of Deep Commitment to Efficiency Planning and Implementation

It is clear that regulators need to work with utilities to encourage a transition to a performance-based structure that aligns utility interests with societal and environmental goals. It might not seem obvious that commitment to and planning and implementation experience with energy efficiency programs are strong precursors of viable performance regulation. But they are.[2]

The systematic pursuit of energy efficiency as a resource, and as a broader effort to transform markets, is not a marginal or adjunct strategy in the evolution to the utility of the future. Instead, it introduces a new way of meeting energy needs. Efficiency might be described as the "gateway drug" for distributed resource development. Energy efficiency is a service as much as it is a resource acquisition strategy. Investment in efficiency is significantly different from traditional distribution utility investment on behalf of customers. It requires the focus and skills that will also be required to integrate other distributed resources into the operation of the monopoly utility (Parker 2014). It is a different kind of investment strategy because:

[2] We acknowledge that there are many ways energy efficiency has been implemented, and there are several workable ways that efficiency capabilities can be acquired. Regulatory and utility commitment is the essential component. Independent providers working under separate regulation, or contractors working with utilities are available options to having the utility in the implementation lead itself.

- Historically it was the first step in recognizing customer investment in their facilities as a (partial) substitute for utility investment in traditional supply and delivery. Distributed generation, combined heat and power (CHP), zero energy buildings, and energy storage are other examples of a similar type of investment by "customers."
- Recognizing efficiency's potential reveals that massive energy improvements in buildings, customer-side resources, and market-based products and services will drive future energy provision. These investments can also mitigate climate change by driving reductions in greenhouse gas emissions. As understandable as this might seem, recognizing their importance creates a tension with traditional utility practice, which assumes that utility investment in ongoing generation, and in poles and wires, is the primary vehicle for meeting energy needs. Since efficiency is now an accepted feature of how we meet these needs, traditional utilities are no longer the "first choice" for providing energy services, nor do utilities stand alone in providing those services.
- Energy efficiency offers a new way of comparing options for meeting customer energy needs. These options compare lifetime costs and consider all associated costs and benefits of energy alternatives. We must extend these methods to guide investment in distributed resources if we are to maximize customer, system, and societal benefits. Utilities, regulators, and consumer advocates are now experienced in cost-effectiveness analysis, assuring the measures acquired actually reduce the costs ultimately borne by consumers.
- Efficiency implementation requires customer relationship skills, knowledge of markets, and broad technology expertise in end uses. These attributes are not "natural" to utilities.
- Many jurisdictions now recognize energy efficiency as a new tool for helping low-income populations—a way to offer social equity. Traditional regulatory practice tends to adjust rates for low-income customers to mitigate the disproportionate costs that energy services can impose on low-income customers. Efficiency strategies (and other distributed resource strategies) empower customers—both low-income and other customers—by providing access to affordable capital for projects that lower their energy costs. These strategies also provide long-term system and societal benefits rather than price distortions (Tong & Wellinghoff 2016).
- The role of energy efficiency (and distributed resource development) for low-income populations has particular urgency in light of the faith in "market solutions" eagerly espoused by many commentators on the utility of the future. Market solutions are likely to both undercut rate subsidies *and* offer heightened advantages to participants with ready access to capital. This version of the future could further marginalize low-income populations, which disproportionately need subsidies and access to capital.

Are New Energy Plans on Track to Creating the Utility of the Future?

In requiring new skills and capabilities by distribution, transmission, and supply entities in the regulated monopoly utility model, an effective utility of the future will depend on the quality of those skills in successfully planning and reconfiguring how they provide service. Even these skills are qualitatively different from the market and customer skills emerging from energy efficiency implementation. How will "next utility" skills be developed, and how will the customer and market skills—and the protections and market support inherent in them—be

preserved? And how will they be enhanced? These questions must be addressed at least in part through performance design, as a prerequisite for an effective transition to the next utility.

An interesting discussion of these issues has surfaced in New York's Reforming the Energy Vision (REV) initiative, which explores energy industry transitions. A recent paper on ratemaking and utility business models (NYDPS 2015) states:

> Unlike competitive companies whose long-term increase in profitability is driven by growing revenues and controlling costs, utilities' earnings are largely a function of increasing investment and controlling short-term expense.
>
> Placing the customers' interests in total bill management, including reliance on DER [distributed energy resources] at the center rather than the fringes of the utility's operating and business models, means that third-party and customer capital and market risk need to be added dimensions to how utilities meet their monopoly service functions. By allowing DER providers to contribute services and capital that result in greater value, innovation, and DER penetration onto the system, utilities' capital requirements and associated returns from traditional cost-of-service regulation may be reduced, and utilities will necessarily incur additional expenses to accommodate these changes.
>
> The conventional regulatory approach prevents the utility from profiting in the long term through the most efficient use of operating resources or through reliance on third-party capital contributions. If utility capital costs are the primary means to achieve utility earnings, then to the extent that market investments could displace utility investments, utilities will have a disincentive to encourage efficient market developments …
>
> It is critical therefore to eliminate, as much as possible, any structural financial incentive embedded in regulation for a utility to favor its own capital spending over third-party activity that meets system needs at lower cost to ratepayers.

The observation about the structure of utility incentives for innovation is on point. But in fact, the capabilities developed within utilities (where they are the implementing entity for efficiency) and within stand-alone energy efficiency utilities (EEUs) are exactly those that utilities need if they are to perform well in a utility-of-the-future market. These skills are producing tangible economic benefits and reducing utility risks. (Binz 2014)

Over the past 25 years, utilities *have* developed market and customer skills in their efficiency programs: technology evaluation, cost-effectiveness analysis, market assessment, program design, planning, effective relationship-building with customers and trade allies, marketing, market-driving strategies, and EM&V capabilities.

These capabilities have emerged through a utility's system benefits charge for efficiency programs usually tied to some form of performance incentive. Or these capabilities have evolved independently, with regulatory oversight, through the creation of an independent energy efficiency provider.[3] REV has ignored the role that efficiency implementation has had in

[3] Vermont spends $50 million a year for its statewide EEU, making it a very affordable investment in energy efficiency. That amount sustains investments in new knowledge, technology, and market capability that utilities have not had to invest in through increases in the cost of service. Other EEUs in Maine, Hawaii, Oregon, and the

assembling these capabilities. It further ignores the structure that has supported their development, and relegates energy efficiency to little more than a small role in the world of the traditional utility—or, at best, to a new level of implementation through the "magic" of the marketplace.[4] When it does discuss energy efficiency, REV is essentially blind to the option of efficiency's potential for *expanding* services to support customers in an integrated and comprehensive manner that would facilitate customer-focused market development and highly effective, integrated investment by customers. What REV does not appear to ask is: "What has New York learned from its substantial investment in energy efficiency, and how can it be adapted to incorporate the new market-focused opportunities before us?"

The second problematic component of the REV approach is that it leaps to a theoretical discussion of the new platforms utilities must create to mobilize market investment and participation. It then assumes that utilities will be able to earn a significant portion of their new revenues from a new "earnings" strategy adopted by regulated utilities. There is little evidence to support this strategy's viability in the energy utility sector (NYDPS 2015). **This shows where REV fails to link clear policy guidance to the design of utility incentive structure.** These market-based earnings (MBEs) are defined as *utility earnings derived from facilitating the creation and transaction of value-added services by active users of the [distributed system platform]* (NYDPS 2015). REV assumes that these new activities will involve sharing customer data (an alarming element for privacy advocates) and granting access to the new platform, as well as activities such as selling heat pumps and designing microgrids.

There is little to suggest that this approach will lead to the design of an effective performance incentive for utilities, guiding them to create a new market structure. In fact, it creates a *new* (and divergent) performance directive: "Make as much of your money as you can by doing these things." There are two serious dangers in this approach:

- **System risks.** There are inadequate incentives to ensure even minimal value to customers, let alone open system architecture and societal benefits. There is no serious discussion of how to design, approve, and regulate such activity. There is nothing to stop inappropriate use of market power. It could also lead to new financial risk for the utility. (What happens if these ventures lose money?)
- **Risk to customers.** There is no inherent emphasis on the customer benefit, product neutrality, and consumer protection built into well-run efficiency programs. The impartial, "trusted advisor" role is what customers and markets rely on to make their decisions in the marketplace. With less (or no) such support, customers might be led astray, and market participation might be temporarily misdirected and ultimately decline.

Are there new roles for distribution utilities at some point, and can they derive revenue from them? Likely, yes. But this will require a performance incentive structure that directs utilities to re-configure the distribution system; integrate distributed resources (including efficiency); and build a smart, dynamic, and interactive grid. Adapting a system benefits charge (whether listed separately on the bill or not) to pay for these activities during a transition, for

---

District of Columbia have proportionally similar budgets, and similar levels of effort exist for efficiency programs that are part of utility operations in Massachusetts, Connecticut, and Rhode Island.

[4] NYSERDA's evolution and the simultaneous decision by many utilities to design and run their own efficiency programs might have limited the recognition of the role that deep and aggressive efficiency efforts can play.

example, might be prudent. In fact, it might be time to consider the energy efficiency operation as a new performance-based, implementation entity, separately regulated.

Revenue Cap Regulation as a Foundation

Almost all leading energy efficiency jurisdictions have adopted some form of utility revenue decoupling. This approach, also known as *revenue cap regulation*, ensures that revenues will not be determined as a function of utility sales. It is an effective tool for removing a major utility disincentive to participate in efficiency, distributed generation, and CHP. It generally needs to be accompanied by measures that will prevent the distribution system operator from taking "…cost-cutting steps that will hurt reliability, safety, and customer satisfaction." For this reason, revenue cap regulation is properly paired with a service quality index mechanism, so that any diminishment of the quality of service will be penalized" (Lazar 2014).

Where revenue cap regulation is in place, energy efficiency is typically treated as a separate activity of the utility, funded through a system benefits charge on the customer's utility bill, with its own process for setting targets, evaluating performance, and rewarding success. This "separate but equal" treatment has resulted in considerable success in Connecticut, Massachusetts, Washington, California, and Rhode Island (for instance). In many such jurisdictions, the utilities' distribution system, supply procurement, and customer relations divisions have begun to recognize the capabilities and knowledge of the efficiency enterprise. But active partnerships are rare. Efficiency offers a modest revenue source, and the lost sales do not actively harm the parent company's net income. This is largely the case in Vermont, Maine, Hawaii, and in Oregon, where the independent EEUs means that the efficiency-related skills are not embedded in the utility and the partnerships to deliver effective service can evolve more effectively across utility boundaries. The increasing interaction between deep efficiency implementation and the pressures on utilities from emerging distributed resource opportunities and mandates create the nexus for the next step in the design of utility performance regulation.

The goal is to reward the utility for actively partnering with the needed customer and market-facilitating functions (whether internal or external to the utility) in a way that maximizes system and societal benefits, while avoiding an expansion of utility monopoly / market control.

The Policy Framework Should Be Dynamic and Open, but Recognize the Value of the Current System

Designing a performance incentive structure can be a little like using the three wishes granted by a genie. The wishes (and the incentive designs) need to be very carefully crafted. Poor design will lead to poor results, as shown by the many examples of experimental mechanisms that have failed to produce desired results (Lazar 2006).

A sound approach will recognize the old model, understand its limitations and distortions, and recognize what it does well in offering reliable, appropriate core services. Such an approach can articulate and promote positive intermediate objectives such as better distribution system use, better voltage control and lower line losses, and better acquisition and effective management of customer energy use (and customer empowerment) information.

Policy can drive specific objectives to be attained by a performance-based regulatory system ("We need to maximize the inclusion of clean, distributed generation to meet our climate goals"). Objectives can also emerge from challenges and opportunities confronting utilities and

regulators, as new mandates and technologies enter the market at accelerating rates ("We have net metering; how are we going to incorporate high levels of distributed generation that might be creating capacity problems on certain feeders?") The "crisis of success" of net metering can best be addressed by steady movement to a performance-based incentive structure that rewards effective integration. The best outcomes will happen when the discussion of the immediate challenge can be considered in the context of the policy objective. The result might be a plan for how the utility could be rewarded for supporting high levels of integration of distributed generation in a manner that enhances reliability, significantly improves the carbon profile of the utility, and supports long-term energy affordability for all customers. The following are examples of dynamic tension between policy objectives and significant technical, financial, and regulatory challenges that performance regulation should be designed to address:

- How can regulators motivate utilities to plan the distribution system from the ground up (rather than reactively), to maximize inclusion of and benefits from efficiency, distributed generation, and demand response?
- Will regulators be able to respond quickly to support flexible and appropriate responses to market changes that challenge the typical regulatory approach and timeline?
- If a primary goal is driving policy, how do regulators work with governors and regional or federal entities in setting efficiency and renewable energy standards that are subject to distribution system planning? For example, how can goal-driven DER activity be coordinated with changing market trends in energy storage and efficient products?
- Is conservation voltage regulation (CVR) a traditional efficiency measure? It is not typically a part of energy efficiency portfolios because its implementation is a function of managing distribution systems, not efficiency markets. CVR should be attractive to utilities because it reduces generation requirements without reducing sales, and reduces expenses without reducing revenues. Even so, it is not common utility practice.
- How do we preserve utility access to affordable capital to adapt transmission and distribution systems when utilities choose to show less capital investment is necessary?
- Should automatic adjustments and tracking continue to be separately calculated in utility tariffs, or should all costs be consolidated into a single, easier-to-understand retail rate?
- How can policy makers reward appropriate investment in systems that facilitate a new and accessible utility system (AMI, and other "intelligent system" functions), while ensuring that they are used effectively, rather than encouraging an approach that simply rewards utility investment as the "default" strategy?
- How can jurisdictions create a platform that facilitates and guides customer and market investments, while still ensuring (and maybe enhancing) reliability and system performance, without full ownership and control by the utility?
- How will cross-sector choices be made consistently and fairly? How should costs and benefits be assessed? For example, how can we design a system that helps fuel switching, natural gas, new energy uses, and CHP to support higher solar saturation?
- How will a utility be rewarded for appropriate investment in control technology to achieve effective load and demand management at regional, system, sub-transmission, and feeder levels?
- How will the utility acquire the skills to design and operate the emerging system?

- What will be the basis for gauging the level of utility return? This is currently the rate base, but phasing away from it will mean the reward from building the rate base will no longer drive decisions.

Start with a Noble Design, and Revise It as You Build

It might be helpful to start with a system based on a rate of return on equity and recovery of allowed costs, with attainable adders for (1) maintaining reliable service and (2) attaining intermediate objectives (via AMI adoption, effective demand response, improved planning, integration of distributed resources.) This implies adopting a new, lower allowed return with potential adders for performance in relation to specific indicators. Such a strategy will ensure the utility must prove it has achieved something beneficial to obtain a fair overall rate of return.

Regulators will then need to establish long-range performance incentives that specify at least three overarching and multi-year objectives tied to a major portion of future performance reward. These goals should be phased in across three to five years, at which point utility rates would be set to cover the interest on debt instruments associated with the cost of capital, but offer no built-in rate of return on utility equity. They would be designed such that the utility could earn slightly above a traditional allowed return on equity if they perform well.

Three hypothetical examples of the overarching indicators are:

1. **A cost-per-unit-used indicator**. This indicator could calculate the "blended cost" of energy. The calculation would involve what are considered distribution costs and traditional supply commodity costs. It would also include in-service efficiency measures provided on an equal footing with the first two.[5] Since efficiency generally has a significantly lower lifetime cost and less variability than most supply options, it would be useful to the utility for driving down average costs. This requires a different framework from one that measures "average cost," since the numerator includes supply side and demand side resource costs and customer-sited generating resource costs. The denominator would be the sum of delivered energy, site-produced energy, and saved energy. This indicator would help the utility support cost-effective efficiency and customer-sited generation. It would also reward utility support for demand response, CVR, smart evolution of the grid, and effective deployment of storage and demand response that could lower supply portfolio costs. It can encourage utility investments in promoting financing strategies that do not disadvantage low-income populations (Tong & Wellinghoff 2016).
2. **A carbon indicator.** This indicator could look at a "carbon-intensity-per-unit" of energy delivered, for example. It can apply to the conventional supply portfolio, to all efficiency currently in service, and would include the ability to track and reward displacement of fossil fuel through beneficial electrification (based on relative carbon profiles). It would include distributed generation on the system and a way might be found to include storage. This indicator would serve to balance the pressure from Indicator 1 to move only to "cheap" carbon sources when they were available.
3. **A "customer equity" or "customer empowerment" indicator.** This should assess the energy burden of customers, particularly customers in the bottom economic

[5] The cost of these efficiency resources should be based on a full societal test, with the cost of efficiency derived from costs attributable to energy saved, and other costs attributed to other benefits.

quartile (Teller-Elsberg et al. 2014). As noted earlier, the new utility model runs the risk of ignoring the needs of vulnerable customers (Tong and Wellinghoff 2016). The old rate subsidy strategies added costs and sent incorrect price signals. A new utility structure could empower all—and especially low-income—customers to reduce their energy use and bills. Deep efficiency, access to renewables, and participation in demand response would all be high priorities. An indicator such as household energy burden could be the basis for new incentive structures. Incentive designs would need to reward strategic assistance in access to capital for these customers.

A Collaborative Approach Might Facilitate the Evolution

Collaboration is a long-standing successful strategy for creating and overseeing utility energy efficiency (Li and Bryson 2015). It allows regulators, state energy offices, utilities, and customer and advocacy groups to participate in active oversight and regulatory input in matters that benefit more from negotiation than from exhaustive litigation. A collaborative to facilitate the transition must be guided by a clear policy framework as already discussed in this paper. It would also need sufficient, independent expertise to assess options for regulatory evolution and the viability of performance structures, and to document actual performance.

- It should test the feasibility of new strategies and new interactions with customers.
- It might use incremental incentive structures as knowledge is gained (cost recovery for pilots), cash incentives for meeting very preliminary targets, and then escalate performance incentives for effective ramp-up of target capabilities.
- Overarching goals should be tied to preliminary structure and tracking mechanisms. Initially they should be treated as a "scorecard," but as incentive design and effective tracking emerge, they should increasingly be within the utility incentive reward structure.

Conclusions

For jurisdictions that are serious about building a new utility model, the notion of a utility rate-of-return base tying earnings to investment levels must be replaced by a system that ties earnings to performance. It should not be tied to either kilowatt-hour sales or utility investment.

Even with a clear policy framework, it is not simple to re-design the utility structure and its underlying and original purpose. On the other hand, with jurisdictions that decide to pursue performance regulation, a lack of clear policy guidance is very likely to thwart positive results.

There is important learning about new regulatory structures through the introduction of energy efficiency programs and through the major shift associated with introduction of retail choice. Regulatory experience that can drive these kinds of policy-guided transitions will need to be built upon and expanded in the transition to performance regulation.

Least-cost procurement has facilitated strategies for "public good" investment in energy efficiency. It has also resulted in utilities' acquiring new skills in addressing market barriers, and interacting with markets and customers. These are not traditional utility capabilities, but they presage a critical component of what the utility of the future might look like. Utilities will need access to these skills, either internally, or through partnerships.

Some proposals for evolution to the utility of the future might inappropriately extend the monopoly power of utilities by seeking to create new revenue streams through privileged market knowledge and relationships of the utilities.

Revenue cap regulation will be a critical basic layer of rate regulation that enables movement to a broader, performance regulation platform.

The challenges for regulators and the risks for consumers are significant. Broad policy goals will guide effective regulation, but to achieve a steady, minimally disruptive transition to a new system, a thoughtful, evolutionary process will be needed. Where utilities have demonstrated good-faith commitment to developing customer-first services, there is likely to be a good opportunity to move forward constructively.

An important discipline for advocates, utilities, and regulators will be to identify where a technical issue is also a policy issue, and an incentive design opportunity. The regulatory system should also consider issues in relation to the long-term goals for the energy system.

The performance structure should start with tiered incentive indicators, to be phased in over time, and revised as experience and learning are gained.

In some jurisdictions a collaborative approach to managing the transition can provide an important forum for addressing complex issues, proposing new solutions, and for providing constructive input to regulators.

References

Averch, Harvey, and L.L.Johnson. 1962. "Behavior of the Firm under Regulatory Constraint." *American Economic Review* 52 (5): 1052–69.

Binz, Ronald J., 2014. "Practicing Risk Aware Electricity Regulation: What Every State Regulator Needs to Know (2014 Update) CERES http://www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation-2014-update/at_download/file

EIA (U.S. Energy Information Administration). 2016. *Electric Power Annual 2014*. February. Washington, DC: EIA. http://www.eia.gov/electricity/annual/.

Lazar, Jim. 2006. "Examples of Good, Bad, and Ugly Decoupling Mechanisms." *NARUC Annual Meeting*. San Francisco. http://pubs.naruc.org/pub/4AC7A83F-2354-D714-5130-4C68971713CB.

Lazar, Jim. 2014. "Performance-Based Regulation for EU Distribution System Operators." Montpelier, Vt.: The Regulatory Assistance Project: 3. www.raponline.org/document/download/id/7332

Lazard. 2015. "Lazard's Levelized Cost of Energy Analysis—Version 9.0. New York: Lazard. https://www.lazard.com/media/2392/lazard-s-levelized-cost-of-energy-analysis-90-key-findings.pdf.

Li, Michael, and J. Bryson. 2015. "Energy Efficiency Collaboratives: Driving Ratepayer-Funded Efficiency through Regulatory Policies Working Group." Washington, DC: State and Local Energy Efficiency Action.

NYDPS (New York Department of Public Service). 2015. “Staff White Paper on Ratemaking and Utility Business Models. Case 14-M-0101. , Appendix A, 6. Albany: DPS. July 24: 29-38. http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={48954621-2BE8-40A8-903E-41D2AD268798}.

Rhode Island Office of Energy Resources, 2016. *Systems Integration Rhode Island Vision Document.* Providence: OER. http://www.energy.ri.gov/documents/siri/Systems%20Integration%20Rhode%20Island%20Vision%20Document%20January%202016%20FINAL.pdf.

Parker, Scudder, and F. Huessy, 2014. “The Utility of the Future: Facilitating ‘Customer Equity’ in an Emerging Energy System.” *Proceedings of the 2014 Summer Study of Energy Efficiency in Buildings.* Washington, DC: American Council for an Energy-Efficient Economy, http://aceee.org/files/proceedings/2014/data/index.htm.

Tong, James, and J. Wellinghoff. 2016. “Empowerment over protection: How Solar and DERs can help the disadvantaged.” *Utility Dive.* February 23. http://www.utilitydive.com/news/empowerment-over-protection-how-solar-and-ders-can-help-the-disadvantaged/414273/.

Teller-Elsberg, Jonathan, B. Sovacool, T. Smith, and E. Laine. 2014. “Energy Costs and Burdens in Vermont: Burdensome for Whom?” Report for the Vermont Low-Income Trust for Electricity. Sharon, Vt.: Vermont Law School, Institute for Energy and the Environment. December.