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WITNESS: RONALD J. BINZ

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EXHIBIT RJB-3
RISK-AWARE PLANNING AND A NEW MODEL FOR THE UTILITY-REGULATOR RELATIONSHIP

Risk-Aware Planning and a New Model for the Utility-Regulator Relationship

The analytical tools for utilities and regulators to take more explicit account of risk, in an increasingly uncertain world, are at hand. What remains is the need for a more effective way to gauge and reward effective utility performance.

by Ron Binz and Dan Mullen

The US electric utility industry has entered what may be the most uncertain, complex and risky period in its history. Several forces are conspiring to make the next two decades especially challenging for electric utilities: large investment requirements, stricter environmental controls, decarbonization, changing energy economics, rapidly evolving technologies and reduced load growth. Navigant Consulting recently observed that "the changes underway in the 21st century electric power sector create a level and complexity of risks that is perhaps unprecedented in the industry's history."[1]

It's often argued that the absence of a coherent federal energy and climate policy is an impediment to progress on the challenges facing the electric industry. That's true, but it's not the complete story. We think the failure of Congress to move in any direction on climate and energy policy increases

Ron Binz *served as the Chairman of the Colorado Public Utilities Commission from 2007 until April 2011, during which time he led the commission in implementing many policy changes championed by Gov. Bill Ritter and the legislature to advance Colorado's "New Energy Economy." He was an active member of the National Association of Regulatory Utility Commissioners, serving as Chair of NARUC's Task Force on Climate Policy, and as a member of both the Energy Resources and Environment and International Affairs Committees.* **Dan Mullen** *is Senior Manager for Ceres' Electric Power Programs, working to advance solutions that will enable the US electric utility industry to meet sustainably society's 21st century energy needs.*

[1] Forrest Small and Lisa Frantzis, *The 21st Century Electric Utility: Positioning for a Low-Carbon Future*, Navigant Consulting 28 (Boston, MA: Ceres, 2010) http://www.ceres.org/resources/reports/the-21st-century-electric-utility-positioning-for-a-low-carbon-future-1.

uncertainty, limits capital availability, and complicates today's decisions, subjecting them to greater risk. But much can be done within existing law at the state level to improve outcomes in electricity markets. Here are three areas where the industry and its regulators can make substantial progress:

- Improving state regulatory outcomes by adopting "risk-aware regulation," focusing attention on the relative risk of resource choices in addition to their costs;
- Developing regulatory models that respond to a changing utility business models and enable industry transformation;
- Making reforms in wholesale market structures for both organized markets and traditionally regulated markets.

Each of these actions comes with a set of nettlesome challenges. This article will focus on the first two areas, risk-aware regulation and the regulatory model; we will address market structure issues in a future article.

Progress in an environment where federal policy is lacking requires greater leadership from state regulators and utility executives, with the assistance of other stakeholders. It requires an enhanced stakeholder conversation to forge agreement on shared goals, desired outcomes, a common understanding and ownership for decisions. At the end of this article, we explore some opportunities to begin this enhanced conversation.

Practicing Risk Aware Regulation[2]

In late 2008, the Brattle Group projected that the collective US electric utility industry – including investor-owned, municipally-owned, and cooperatively-owned utilities – would need to invest capital at an elevated rate of about $100 billion per year between 2010 and 2030.[3] This level of investment – to replace aging infrastructure, deploy new technologies and meet future consumer needs – is considerably higher than the country has seen in many decades. Within a relatively compressed timeframe it would roughly double the net invested capital in the US electricity system.

Electric utilities, in total, must invest capital at the rate of some $100 billion annually between 2010 and 2030 – a staggering challenge.

One might argue that the main task facing state electricity regulators today is to ensure that this money is spent wisely. Given the uncertainties facing the sector and the long-term nature of most utility infrastructure investments, this alone would be no mean feat. Developing robust, sophisticated methods for evaluating proposed utility

[2] For a fuller exposition of this issue, see the report we developed with co-authors Richard Sedano and Denise Furey entitled *Practicing Risk-Aware Electricity Regulation: What Every State Regulator Needs to Know* (Boston, MA: Ceres, 2012), http://www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation/view.

[3] Marc Chupka et al., *Transforming America's Power Industry: The Investment Challenge 2010-2030*, The Brattle Group vi (Washington DC: The Edison Foundation, 2008) http://www.brattle.com/_documents/UploadLibrary/Upload725.pdf.

investments – identifying which investments make the most sense in the widest range of future scenarios – is essential for regulators who strive to serve the public interest.[4]

One useful notion for regulators in this regard is the concept of *risk*, and the importance of managing risk in the regulatory arena. Recognizing, minimizing and allocating fairly the risks associated with the elevated investment level is an agenda that we believe all regulators should support.

Risk arises when there is potential harm from an adverse event that can occur with some degree of probability. In mathematical terms:

$$\text{Risk} = \sum_i \text{Event}_i \times (\text{Probability of Event}_i)$$

for a situation in which a set of independent events will cause a loss with some probability. In plain English, risk is simply the sum of each possible loss times the probability of that loss, assuming the events are independent of each other. If a financial instrument valued at $100 million would be worth $60 million in bankruptcy, and the probability of bankruptcy is two percent, then the bankruptcy risk associated with that instrument is said to be ($100 million - $60 million) x 2%, or $800,000.

Thus, risk is the expected value of a potential loss. Higher risk for a resource or portfolio means a larger expected value of a potential loss; that is, either more value is at stake, or the likelihood of a financial loss is greater, or both.

Analyzing costs of different resource options is commonplace at regulatory commissions; analyzing risks is far less common. The lack of attention to risk has drawbacks. Thinking about cost (even assuming the underlying estimates are accurate) gives one a general sense of how expensive a resource will be to acquire if things go more or less according to plan. Thinking about risks – about the ways that adverse events and unpredictable circumstances could add unexpected cost and create a financial loss – gives a much fuller picture of cost over the long term. The benefit of anticipating the future costs that risks represent, of course, is to create a situation where things not going according to plan is incorporated, so even if events diverge from those anticipated, the outcomes are still more or less according to plan.

For this discussion of risk, we focus on generation technologies, although the approach applies generally to other utility investments. There are several reasons for this choice of focus. As the largest share of utility spending in the current build cycle, generation investment is where the largest amounts of consumer and investor dollars are at stake. Today's decisions about generation investment can also trigger (or avoid) substantial future investments in transmission and distribution infrastructure. Proposed power plants can be a lightning rod for controversy, heightening public scrutiny of regulatory and utility decision-makers. Since they are so large, generation investments can limit utilities' financial abilities to take on other investments. Finally, poor investment decisions about generation resources in IOUs'

[4] Consider this discussion of utility scenario planning, http://www.electricitypolicy.com/archives/2974-utility-scenario-planning-always-acceptable-vs-the-optimal-solution

last major build cycle resulted in tens of billions of dollars of losses for consumers, shareholders, and society.[5]

Risks associated with electric system resources have both cost-related and time-related aspects. *Cost risks* reflect the possibilities that investments will not cost what one expects, or that cost recovery for investments will differ from expectations. *Time risks* reflect the possibility that circumstances will change over the life of investments and materially affect both the costs of investments and the degree to which they benefit consumers.

To establish relative risk associated with each new generation resource, we compress a variety of risks into seven main categories:

1. **Construction Cost Risk:** unplanned cost increases, delays and imprudent utility actions.
2. **Fuel and Operating Cost Risk:** fuel cost and availability, as well as O&M cost risks.
3. **New Regulation Risk:** air and water quality rules, waste disposal, land use, and zoning.
4. **Carbon Price Risk:** state or federal limits on greenhouse gas emissions., costs for those emissions or damages resulting from plaintiffs' lawsuits.
5. **Water Constraint Risk:** availability, quality, and cost of cooling and process water.
6. **Capital Shock Risk:** availability and cost of capital, and risk to firm due to project size.
7. **Planning Risk:** includes risk of inaccurate load forecasts, competitive pressures.

With this categorization, it is possible to evaluate a range of fossil, nuclear and renewable generation technologies, as well as the demand-side resources of energy efficiency and demand response by applying one's informed judgment to quantify each resource's relative exposure to each type of risk.[6] Combining this analysis with commonly accepted estimates of the levelized cost of energy (LCOE)[7] for each resource yields the

[5] Regulated utilities' last major build cycle occurred in the 1970s and 1980s, when the industry focused mainly on building new nuclear power plants but ultimately abandoned more than 100 nuclear plants in various stages of development. The natural gas build-out of the 1990s and early 2000s was led by independent power producers, not regulated utilities.

[6] Risk exposure in each risk category ranges from "None" to "Very High." We assigned scores (None = 0, Very High = 4) to each risk category for each resource and then summed them to establish an indicative quantitative ranking of composite risk. We also tested the robustness of the risk ranking by calculating two additional rankings of the risk scores: one that overweighted the cost-related risk categories and one that overweighted the environmental-related risk categories.

[7] LCOE indicates the cost per megawatt-hour for electricity over the life of the plant, encompassing all expected costs (e.g., capital, operations and maintenance, and fuel). We primarily reference LCOE data compiled by the Union of Concerned Scientists (UCS), which aggregates three common sources of largely consensus LCOE data: the US Energy Information Administration (EIA), the California Energy Commission (CEC) and the investment firm Lazard; see Barbara Freese et al., A Risky Proposition (Cambridge, MA: Union of Concerned Scientists, 2011),

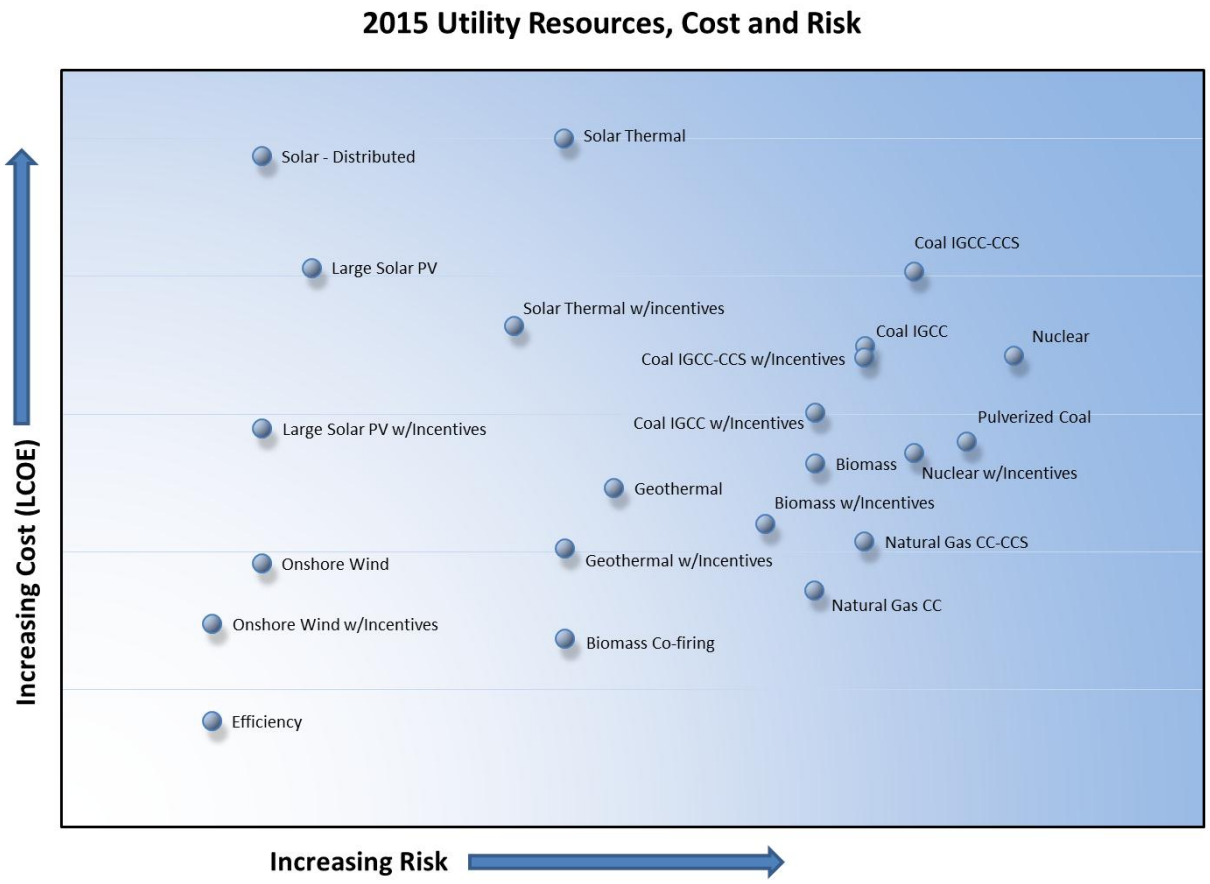

Figure 1: Cost and Risk Chart

graphic in **Figure 1**, showing on two axes the relative costs and risks of various generation technologies: [8]

This type of analysis can be extended naturally to portfolios of resources that function together to serve load for a utility. For a real-life example of a thorough analysis of cost and risk, consider the recent integrated resource plan completed by the Tennessee Valley Authority.[9] TVA subjected each of the following five resource strategies to extensive scenario analysis:

- **Strategy A:** Limited Change in Current Resource Portfolio
- **Strategy B:** Baseline Plan Resource Portfolio
- **Strategy C:** Diversity Focused Resource Portfolio

http://www.ucsusa.org/assets/documents/clean_energy/a-risky-proposition_report.pdf. LCOE costs for technologies not included in UCS's analysis (viz., biomass co-firing, combined cycle natural gas generation with CCS, and distributed solar) were estimated by the authors based on comparable resources referenced by UCS.

[8] Resources are assumed to come online in 2015.

[9] Tennessee Valley Authority (TVA), TVA's Environmental and Energy Future (Knoxville, TN: Tennessee Valley Authority, 2011), 161, http://www.tva.com/environment/reports/irp/pdf/Final_IRP_complete.pdf.

- **Strategy D:** Nuclear Focused Resource Portfolio
- **Strategy E:** EEDR (Energy Efficiency/Demand Response) and Renewables Focused Resource Portfolio

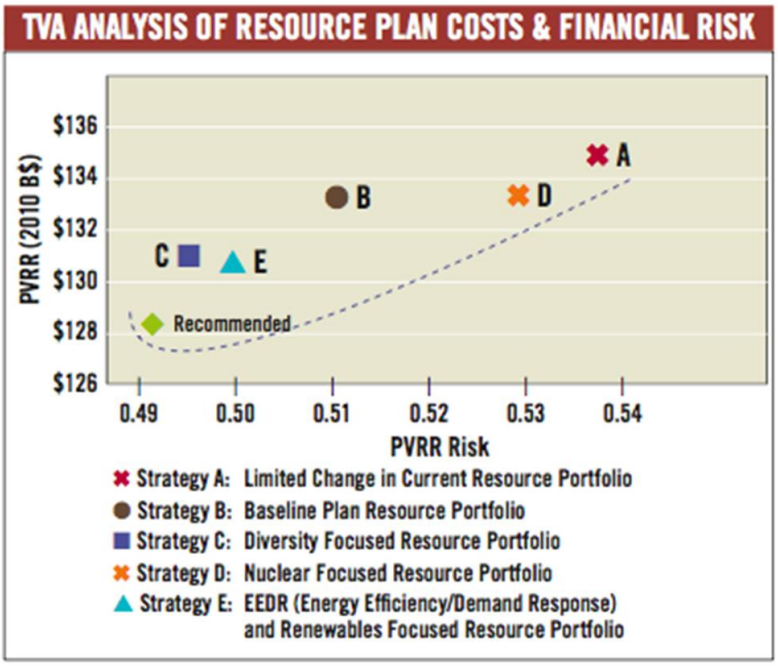

Figure 2: TVA's "Efficient Frontier"

Figure 2 shows how each of these strategies mapped out along an "efficient frontier" according to TVA's analysis of cost and risk. The highest-cost, highest-risk strategies were those that maintained TVA's current resource portfolio[10] or emphasized new nuclear plant construction. The lowest-cost, lowest-risk strategies were the ones that diversified TVA's resource portfolio by increasing TVA's investment in energy efficiency and renewable energy.

Readers may be surprised that a traditional utility such as TVA would reach conclusions so favorable to resources like energy efficiency and renewable energy. But from a risk management perspective, this makes sense. Our analysis indicates that these classes of resources are in the lower left corner of the risk/cost chart.[11]

Their addition to the portfolio also provides important diversification. Just as financial investors diversify their investment portfolios to reduce volatility and outsized swings in value, so can utilities diversify their energy portfolios. Diversification in a utility portfolio means including various supply and demand-side resources that behave independently from each other in different future scenarios so that overall risk and cost are minimized over the long term. In TVA's case, it means ramping up investments in efficiency and renewables to provide diversity in its current, largely nuclear and fossil-based fleet.

How should regulators go about practicing "risk-aware regulation"? We have seven recommendations for regulatory actions that will manage risk over the longer term:

1. **Diversify utility supply portfolios** with an emphasis on low-carbon resources and energy efficiency. Our risk ranking shows

[10] As of spring 2010, TVA's generation mix consisted mainly of coal (40 percent), natural gas (25 percent) and nuclear (18 percent); see TVA, 73.

[11] In its "Sixth Northwest Conservation and Electric Power Plan," the Northwest Power and Conservation Council reached similar conclusions after an extensive process. See the plan at www.nwcouncil.org/energy/powerplan/6/default.htm.

a clear preference for renewable energy and energy efficiency, which are generally far less exposed to many of the risks facing conventional technologies. Notably, energy efficiency ranks lowest in both cost and risk.

2. **Utilize robust planning processes** for all utility investment. Careful planning is the regulator's primary risk management tool. Effective planning ensures that utilities, regulators and other stakeholders have a common understanding of a full spectrum of utility resource options; that the options are examined in a structured, disciplined way; that demand-side resources get equal consideration alongside supply-side resources; and that the final resource plan is understood by all.

3. **Employ transparent ratemaking practices** that reveal risk and don't obscure it. For example, allowing a current return on construction work in progress (CWIP) to enable utilities to finance large projects doesn't actually reduce risk, but rather transfers it from the utility to consumers.[12]

VARIABILITY VS. RISK

Certain resources, like wind, solar, and some hydropower facilities, are termed "intermittent" or "variable" resources. While the power produced by them can be characterized over the long run and successfully predicted in the short run, it cannot be precisely scheduled or dispatched. But variability should not be confused with the concept of risk. Recall that risk is the expected value of a loss. In this case, the "loss" would be that the plant does not perform as expected – that it does not fulfill its role in a generation portfolio. For wind or solar, variability is expected and accommodated in the portfolio design. Thus, while individual wind towers might be highly variable, and a collection of towers in a wind farm less so, a wind farm can be termed highly reliable and present low risk because it will likely operate as predicted.

For more detail, see the recent WGA report "Meeting Renewable Energy Targets in the West at Least Cost: The Integration Challenge." http://www.westgov.org/wieb/

4. **Use financial and physical hedges**, including long-term contracts. These allow utilities to lock in a price (e.g., for fuel), thereby avoiding the risk of higher market prices later. But these options must be used carefully since using them can foreclose an opportunity to enjoy lower market prices.

5. **Hold utilities accountable** for their obligations and commitments. This helps create a consistent, stable regulatory environment (highly valued among rating agencies) and ensures that agreed-upon resource plans become reality.

6. **Operate in active, "legislative" mode,** continually seeking out and addressing risk. In "judicial mode," a regulator takes in evidence in formal settings and resolves disputes; in contrast, a regulator operating in "legislative mode" proactively seeks to

[12] The use of CWIP financing in Florida could result in Progress Energy customers paying the utility more than $1 billion for a new nuclear plant (the Levy County Nuclear Power Plant) that may never be built. Unfortunately for consumers, Florida state law prohibits ratepayers from recouping their investment in Levy or other CWIP-financed projects.

gather all relevant information and to find solutions to future challenges[13].

7. **Reform and re-invent ratemaking policies** as appropriate. Today's energy industry faces disruptions similar to those experienced by the telecommunications industry over the past two decades, which led regulators to modernize their tools and experiment with various types of incentive regulations. One area where electricity regulators might profitably question existing practices is rate design; existing pricing structures should be reviewed for the incentives they provide for customers and the outcomes they create for utilities.

While this approach applies most obviously to investment decisions for new generation, a similar approach can be applied to the "retire or retrofit" decisions facing utilities with insufficiently controlled coal plants. It also applies to decisions about increasing energy efficiency investment in restructured states. Finally, regulators in all states face a host of challenges regarding distribution and smart grid investments, topics the authors anticipate addressing in a subsequent report.

There are many benefits of risk-aware regulation and they flow to all stakeholders. Consumers will benefit from improved regulatory decision-making and greater utility investment in lower-risk resources. Utilities will benefit from a more stable business environment and enhanced long-term planning capabilities. Investors will benefit from lowered threats to utility cost recovery, which simultaneously preserves utility credit quality and keeps financing costs low, benefitting all stakeholders. The regulatory process itself will benefit: expanded transparency and sophisticated analysis will strengthen stakeholder relationships, build trust and improve understanding of energy options – all of which enhances regulators' ability to do their jobs. And society generally will benefit from a cleaner, smarter, more resilient electricity system.

Risk is an issue that regulators and utilities must address directly. Since risk is defined as a probability, by definition it is probable that some risks will be realized – i.e., sooner or later, risk will translate into dollars for consumers, investors or both. Risk cannot be eliminated, but it can be minimized and managed. For this reason, ignoring risk is not a viable strategy; neither is failing to make decisions or relying on fate. Risk-aware regulation should become the hallmark of effective regulatory practice.

The Evolving Utility Business Model and New Regulatory Approaches

In his 2008 book *Smart Power*,[14] Peter Fox-Penner initiated a dialogue about the evolving utility business model. He posited "two and a half" options where utility business models of the future might aggregate: the "smart

[13] Consider this admonition from the 2nd Circuit Court of Appeals in *Scenic Hudson Preservation Conference v. Federal Power Commission*, 354 F. 2nd 608 (1965). The role of a regulator "does not permit it to act as an umpire blandly calling balls and strikes for adversaries appearing before it; the right of the public must receive active and affirmative protection at the hands of the Commission."

[14] Peter Fox-Penner, *Smart Power* (Washington DC: Island Press, 2010).

integrator" model, the "energy service utility" model, and the (less developed) municipal-local aggregator model.

Since the publication of his book, movement toward those models has probably been slower than most would have predicted, due mainly, we think, to the interrelated factors of congressional inaction on climate policy, the downturn in the US economy, and slow progress toward a smarter grid. Nonetheless, we agree with Fox-Penner's thesis and expect to see inexorable movement toward these or similar models, accelerating as the economy improves, new technology continues to pile up at the utilities' door, as environmental concerns become greater and as US energy policy becomes clearer.

A threshold question is whether state utility regulation will evolve to enable the necessary industry changes, or merely follow them, or worst, stand in the way.

An important threshold question is whether state utility regulation will evolve simultaneously to enable the necessary industry changes, merely follow them, or worst, stand in the way. Just as the industry practices of the last century are not likely to be adequate for the future, state utility regulation may be ill-equipped to accommodate, much less support, the changes happening in the industry.

As practiced today, utility regulation provides limited motivation for utilities to innovate, diversify to manage risks, or undertake new efficiencies. While there are exceptions, state regulation often exhibits cumbersome processes, is overly judicial and confrontational in character and isn't well suited to dealing with fundamental changes in market conditions. Bottom line, it's not clear that regulation is actually rewarding utilities for behavior that society wants the companies to undertake.

Utilities 2020

The significant challenges facing the utility industry suggest that the time is ripe to explore a revised compact among utilities, regulators and the consumers they serve. **Utilities 2020** is an effort of two former state regulators[15] to involve stakeholders – commissioners, utilities, the financial community, and consumer and environmental leaders – in developing a menu of approaches that improve regulatory outcomes and more closely align incentives with desired utility behaviors. In its initial phase, **Utilities 2020** is conducting in-depth, private interviews with executives, regulators, and consumer and industry thought leaders, gathering raw material for its recommendations and stakeholder dialogues and collaborations. **Utilities 2020** is advised by a council of energy policy professionals.[16]

[15] Utilities 2020 is headed by one of the authors, former Colorado Public Utilities Commission Chairman Ron Binz, and by Ron Lehr, also a former Colorado PUC Chairman. The project is funded by the Energy Foundation.

[16] The Utilities 2020 Advisory Council includes John Bohn, Paul Bonavia, Ashley Brown, Ralph

Which areas are emerging as ripe for reform? Drawing first from discussions with C-level utility executives, the Utilities 2020 team heard strong support for changing the terms of the regulatory bargain and improving the regulatory process. The conversations revealed these areas of concern and hopes for action among utility executives:

- **Clearer and more consistent policies.** We heard frequently that regulators (and other policy makers) do not clearly communicate the policies or even the outcomes they wish to achieve. Several executives were concerned about the inconsistent direction ("lurching back and forth") of state-level energy policy. Others noted that strategies are *ad hoc* and fragmented, rather than coherent and aligned.
- **Better incentives towards (firm) efficiency.** A large majority of the CEOs agreed that, under current practice, regulation does not provide utilities with meaningful incentives to improve internal efficiencies. We heard that "if we save a buck, they take it away from us in the next rate case," and that "our best outcome is that we recover the cost of a measure; there's no upside."
- **Better understanding by regulators of the utility business.** One executive pointed out that utilities are very good at project management and that regulators need to take more advantage of these skill sets. One CEO complained that some regulators have a "fundamental ignorance" of the operations and concerns of the utility business. Other executives expressed the wish that regulators would have more time to consider "big picture" issues instead of only regulatory details. Giving regulators more resources is one approach to solving this; another is to change the priorities that regulators face.
- **Certainty on climate policies and regulation of carbon emissions.** Most executives seek a predictable climate policy and expressed a desire to move forward with decarbonization of the generation fleet. Some expressed concerns that the compliance timelines for EPA emission rules were too short, but others didn't see the EPA rules as a problem.
- **Healthier working relationship with regulators and staff.** While some executives reported good relationships with regulatory agencies, several executives mentioned that working relationships with regulatory staffs were poor; one used the term "poisonous" to describe the relationship. Another executive noted that there was no trust: that the commission staff doesn't accept that a utility might do something for the right reason, and seems always to suspect hidden agendas.

In discussions with regulators and other stakeholders (including consumer advocates and former regulators), other themes developed:

- **Higher rates.** Most of the regulators expressed the primary concern that

Cavanagh, Richard Cortright, Peter Fox-Penner, Lena Hansen, James Newcomb, John Nielsen, Sonny Popowsky, John Quackenbush, Lisa Schwartz, and V. John White.

challenges facing utilities, particularly the wall of investment that they must climb, will translate into higher consumer rates. Compared to utility executives, regulators appeared less concerned about the fate of utilities in view of the acknowledged challenges they face.

- **Openness to change.** The regulators we interviewed were open to changes in the mode of regulation, but did not display the urgency for making deep changes that we observed among utility executives. The environmental advocates expressed support for a fundamental change to the system of incentives that regulation provides.
- **Inadequacy of resources.** Several regulators cited insufficient resources and the lack of flexibility in their budget process as fundamental problems with the *status quo*. Commissioners generally doubted their ability to divert resources from standard regulatory duties to other priorities.
- **Barriers to communication.** We found a wide variety of approaches in state law for how commissioners communicated with each other and with their staffs. In most cases, communications are limited, especially among commissioners and between commissioners and stakeholders.
- **Dissatisfaction with the adversarial process**. Regulators and some of the advocates expressed frustration with the adversarial process. Some commissioners expressed hopes for more settlements among parties and more use of "non-adversarial" processes. Advocates expressed concern about the high cost and slow pace of the existing process.

Incentives provided by regulation

Economist Alfred Kahn famously observed that "all regulation is incentive regulation." By this he meant that any version of economic regulation provides firms with incentives to make choices. As the debate about decoupling shows, asking utilities to take actions that are in conflict with the profit incentive – such as selling less electricity – is difficult to square with the basic incentives of today's style of regulation.

We need to align regulatory incentives so that healthy utilities can pursue society's broader policy goals in ways that also benefit customers and shareholders.

To respond to the huge challenges facing utilities and society, we need to find ways to compensate utilities fairly while providing them the incentive to pursue society's broader policy goals. Utilities must be encouraged to decarbonize their fleets, improve their firms' overall as well as project level efficiencies, and serve customers in new ways. In short, we need to align regulatory incentives so that healthy utilities can pursue society's broader policy goals in ways that also benefit customers and shareholders.

The CEO interviews confirm that today's regulatory structure offers few incentives for corporate efficiency throughout a utility. This is significant because increased profitability,

derived from eliminating inefficiencies, could be used to offset anticipated cost increases they are facing and could potentially be used to "fund" certain outcomes desired for utilities, such as movement towards cleaner generation resources and new consumer services.

As the **Utilities 2020** project proceeds, we will explore with stakeholders a variety of alternative practices for state regulation. It's clear that a spectrum of approaches will be needed, and no set of regulatory reforms will work everywhere. Regulation at the state level fulfills Justice Brandeis' notion of states as laboratories: there are many approaches to economic regulation across the country, although most are variations on the basic model of rate base/rate of return economic regulation. Of the various alternative models, we highlight three here: (1) the UK price cap model; (2) the "Iowa model"; and (3) a "grand bargain."

The UK's RIIO model

Electric and gas distribution utilities in the United Kingdom are regulated under a comprehensive price cap regime called RIIO, which stands for "**R**evenue using **I**ncentives to deliver **I**nnovation and **O**utputs."[17] RIIO builds on the price cap regime used in the UK for the past 20 years for energy companies (called "RPI-X"), adding a system of rewards and penalties tied to performance on desired outcomes (or "outputs") to be achieved by regulated companies. This new UK model seeks "value for money." New rewards and penalties provide an incentive system to encourage operational efficiencies, funding for innovation and opportunities for utilities to involve third parties in energy delivery.

Key features of the RIIO model include: enhanced stakeholder engagement and third party involvement; a longer-term price control period (eight years, up from five); incentives for outperforming on output metrics; and an innovation stimulus component. RIIO is administered by the Office of Gas and Electricity Markets (Ofgem), which expresses its expectations this way:

> "We are committing to a price control framework that encourages network companies to deliver in response to commercial incentives with the potential to earn higher returns and face less intensive regulatory scrutiny if they innovate and outperform in delivering a safe, secure and low carbon energy sector and value for money. Companies that do not deliver will see lower returns and more intensive regulatory scrutiny. . . The model is designed to promote smarter gas and electricity networks for a low carbon future."

Under RIIO, utilities are measured for the performance on seven output measures:

- customer satisfaction,
- reliability and availability,
- safe network services,
- connection terms,
- environmental impact,
- social obligations, and
- price.

[17] *RIIO: A New Way to Regulate Energy Networks, Final Decision*. Rep. no. 128/10. Office of Gas and Electricity Markets, Oct. 2010, www.ofgem.gov.uk.

The revenues of network companies in the UK will be subject to financial incentives (both positive and negative) based on their performance on delivering on each of these "primary" objectives. Ofgem notes that it will employ financial incentives when there is clarity on the primary outputs to be delivered; when there is confidence in the data used to measure performance; when delivery of the primary output is important; and when there are not already incentives in place on the network company through other schemes or obligations.[18]

Regulation has become confrontational, is often mired in judicial process, and exists amid a charged political setting. It's hard to imagine a worse recipe for managing the transformation of the utility industry.

Price cap regulation for energy companies in the UK has been used for over twenty years, since privatization of the sector. In the US, regulators haven't often used formal price cap regulation for energy utilities. Its use has been limited to mainly to telecommunication carriers at the state and federal level, where it appears to have been successful in bringing down the costs of exchange access for the former Bell System.

With its focus on outputs and its longer-term pricing horizon, something akin to the RIIO model might be able to liberate savings from efficiency at utilities, offer the companies more regulatory and policy consistency and longer investment and management time horizons, while also offering a mechanism to focus the utilities on a set of desired outcomes.

The Iowa Model

The "Iowa Model" probably never set out to be a model. Over seventeen years, it became a sufficiently interesting case history that we think it now deserves to be called a model.

MidAmerican Energy Corp. is a vertically-integrated company serving 640,000 customers in Iowa. For seventeen years, from 1995 to 2012, MidAmerican did not change its retail prices in Iowa; nor did it utilize "adjustment mechanisms" to track costs. Instead, the rates in effect in 1995 were continued without change through a series of settlement agreements involving MidAmerican, the staff of the Iowa Utilities Board, the Office of Consumer Advocate, and other interested parties. The terms of the settlement agreements evolved over time but generally provided for a fixed settlement period, a formula for sharing over-earnings and an "escape clause."

From MidAmerican's point of view, the success of the Iowa plan relied on two assumptions: (1) significant opportunities existed for efficiency gains; and (2) generation could be sold in both wholesale and retail markets, and shortfalls in one market could in most cases be made up in the other. To protect against a sharp increase in mandated

[18] *Handbook for implementing the RIIO model.* Office of Gas and Electricity Markets, Oct. 2010, www.ofgem.gov.uk.

costs or the failure of both the wholesale market and retail market to produce acceptable margins, the Iowa plan settlements contained an escape clause that allowed the utility to seek higher rates if returns fell 200 basis points below the cost of capital.

MidAmerican's earnings grew steadily during the period of the settlements, with returns on equity sometimes reaching the high teen percentages. Several times the "excess" earnings were split with ratepayers, resulting in bill credits. In the later settlement agreements, the customers' share of excess earnings was used to lower the cost of new generation plants by "pre-funding" depreciation expense for the plants. During the seventeen years, MidAmerican built several new generating plants in Iowa, including large amounts of wind generation, all without raising customer rates.

Speaking with MidAmerican executives, we learned that the utility felt empowered to undertake operational efficiencies because the company knew it would be able to return at least a fraction of the savings to shareholders. The extended rate freeze allowed MidAmerican's Iowa rates to fall well below the national average. During the term of the rate agreements, MidAmerican was purchased by Warren Buffet's Berkshire Hathaway, another company well known for a focus on long term performance.

While not technically a price cap regime, the Iowa experience exhibits a system that would provide the longer-term stability in regulation, incentives to improve efficiency, and rely on a settlement-based process that would lessen the transaction costs associated with the adversarial process.

A Grand Bargain

Meaningful dialogue among utilities, regulators and other stakeholders is often difficult to achieve. The system of utility regulation has grown to be very confrontational, is often wrapped in judicial processes and usually exists in a charged political setting. It's hard to imagine a worse recipe for managing the transformation of the utility industry and for the development of creative responses to the challenges facing the industry and its consumers.

In current practice, state regulatory agencies often treat utility prices and performance in an *ad hoc* fashion: one set of cost recovery mechanisms for this activity, another set for a different activity; one incentive scheme for this goal, another scheme for that goal. An alternative to traditional issue-by-issue ratemaking might be called "a grand bargain."

This model would combine aspects of both the RIIO model and the Iowa model. The object would be to produce through negotiation a thorough regulatory regime that would address a broad set of issues in a consistent manner. A regulatory commission might, for example, direct a utility to undertake negotiations with a broad set of stakeholders, including the commission's staff, which would be equipped with guidance from the commission. The direction from the commission would be to negotiate a multi-year agreement concerning rates, cost recovery mechanisms, quality of service goals, environmental performance, energy efficiency goals, incentives, etc.

The commission could supply as much detail and direction to the parties as it prefers. For example, a commission

might specify that the eventual agreement must contain certain performance benchmarks for the utility, as well as incentives and penalties to motivate compliance with the agreement. To motivate parties to settle, the commission could indicate from the outset its likely acceptance of a settlement agreed to by a significant group of stakeholders, even if the agreement were not unanimous. For each of the five essential elements of administrative due process, a less formal but still effective set of procedural processes could be used: notice, a hearing, a fair decision maker, a record, and a chance to appeal. Transparency would need to be maintained, so that outcomes would be reached in open discussions. Where agreements elude such a stakeholder-driven process, the commission could still apply its formal decision making routines, acting on a more limited and better-defined set of remaining issues.

The details of the Grand Bargain model are fluid. It stands principally for the concept that, with appropriate motivation and attention from a regulatory agency, a set of stakeholders might be able to craft a solution that is superior to, and more internally consistent than, a regime that arises out of multiple contested cases at a commission.

A Path Forward

Energy utilities and their regulators face enormous challenges over the next two decades. And regulatory practice today is not without its shortcomings. Some are structural and might require legislative actions to change; others are within the power of regulatory agencies and stakeholders to repair. The bottom line: energy utilities need to change and regulation needs to step up its game.

There are several major impediments to progress. First is the lack of direct, honest communications among stakeholders, especially between the utilities and their regulators. There are few effective forums for developing shared agendas outside the stilted process in the hearing room. A second difficulty is the relatively short professional lifespan of many regulators: the median term of a state regulator is now only 3.7 years.[19] While regulators must lead reforms, the effort must transcend individual commissioners and also become lodged in institutions that intersect with the regulatory agencies.

The **Utilities 2020** project will attempt to improve communications among stakeholders and to present alternative regulatory regimes for their consideration, such as the three alternative models highlighted in this article. Over the next year, **Utilities 2020** will host several dialogues among stakeholders designed to develop a shared vision and actively examine new regulatory models. The project hopes to engage other institutional players in this effort and identify utility and commission pairs that wish to move forward with new approaches. ■

[19] Janice A. Beecher, IPU Research Note: Commissioner Demographics 2012 (East Lansing, Mich.. State University, 2012), http://ipu.msu.edu/research/pdfs/IPU-Commissioner-Demographics-2012.pdf.