

**EXH. RJB-4
DOCKETS UE-220066/UG-220067
2022 PSE GENERAL RATE CASE
WITNESS: RONALD J. BINZ**

**BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND
TRANSPORTATION COMMISSION,**

Complainant,

v.

PUGET SOUND ENERGY,

Respondent.

**Docket UE-220066
Docket UG-220067**

**THIRD EXHIBIT (NONCONFIDENTIAL) TO
THE PREFILED RESPONSE TESTIMONY OF**

RONALD J. BINZ

**ON BEHALF OF NW ENERGY COALITION, FRONT AND CENTERED, AND
SIERRA CLUB**

JULY 28, 2022

Utilities 2020 Report

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Utilities 2020 Report: Key Findings

Introduction

In early 2012 Energy Foundation funded a project called **Utilities 2020**. **Utilities 2020** was proposed as a “research and action project” to explore the connected issues of evolving utility business models and changes to state utility regulation needed to enable the evolution of new utility business models.

From January to December 2012, the principals of Utilities 2020 conducted research, interviewed industry leaders, queried colleagues, visited with regulators, spoke at conferences and hosted dialogues. In October, Utilities 2020 hosted a dialogue involving twelve state regulators from across the county, together with senior executives from eight utilities, consumer advocates and other experts in energy and regulation. In December, Utilities 2020 principals hosted a meeting in Boston of seven “tribal elders” discussing new utility business models, as part of their preparation for a white paper for another Energy Foundation-funded project.

The results of this twelve-month inquiry indicate that there is a need to consider new utility business models and regulation that supports them. The report that follows details the inquiry and lays out the key findings of the Utilities 2020 project.

The balance of this report is comprised of seven sections:

- [Summary of Findings](#)
- [Overview of Utilities 2020 Activities](#)
- [The Utilities 2020 Advisory Council](#)
- [Interviews and Dialogues](#)
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Summary of Findings

We found that overall the general idea that new utility business models and regulatory incentives are needed was supported by most who were engaged by the project. The circumstances utilities currently face that motivate interest in new ways of doing business and the limitations that impact regulation suggested to most that more attention to opportunities to reform business and regulation was justified

Findings

Need

- The need for changed utility business models was confirmed in virtually every conversation with industry, regulatory, consumer and environmental representatives.
- There is a spectrum of opinions about the future role of the utility, but agreement that future demands on utilities require a re-orientation of the nation's electric utilities.
- There is broad consensus, but not unanimity, that regulation must be substantially changed to accommodate evolving utility business models.
- There are a variety of opinions about the timing of the eventual transition, with regulators and consumers tending to think the transition will be slow; industry leaders and environmental leaders perceive more pressure and expect a shorter timeframe.
- Not unexpectedly, there is a spectrum of approaches ranging from making only incremental changes to regulation, to adopting entirely new paradigms.

Interest

- Reception for the Utilities 2020 project was very strong.
- Strongest interest comes from two sources: electric utility industry representatives and environmental leaders.
- Regulators appear to be less motivated to move forward, especially with respect to new regulatory models. Often overloaded with shorter-term concerns, they do not typically focus on existential issues concerning the role of regulation.
- Investors (as represented by Wall Street analysts) are interested in a modified utility and regulator bargain, with the proviso that earnings become more predictable.
- Evidence of both need and interest is shown by the growing list of entities undertaking their own investigations and discussions of new business models, including: Edison Electric Institute; the Department of Energy;

Energy Futures Coalition, Advanced Energy Economy, CERES, Colorado State University; Arizona State University; Rocky Mountain Institute; Energy Innovations (on behalf of the Energy Foundation) and many others.

Resources

- All stakeholders report that a neutral convener will be required to make progress.
- One of the best resources is likely to be former state commissioners, since they will have learned enough to appreciate the issues detailed in this report, they have more time to do something about them than current commissioners, and they have a basis for communicating with current commissioners and staff due to their shared experience.

Challenges

- The electric power industry in the United States is very diverse and fragmented. Unlike many other countries in the world, with relatively few, large utilities, there are 3000+ utilities in the U.S.
- The industry is segmented into three major types of utilities: investor-owned, cooperative and municipal. Each has its own regulatory apparatus and idiosyncratic set of incentives.
- There is a comparative lack of academic and industry literature on the subject of potential new regulatory and utility business models.
- The view of the appropriate role for state regulators varies across the country.

Recommendations

- Organizations with interest and incipient efforts in the same area of research and action need to be involved. A coordinating hub could share information across the various efforts.
- To build support, research and writing, conferences and workshops, webinars and meetings will need to be held to expand understanding and interest in the concepts. A likely model for development and diffusion of ideas is the manner in which the IRP concept was fostered and spread among utilities and regulators in the 1980s.
- Goals following on this project include: i) conducting additional, larger dialogues, reporting and expanding their outcomes to make more information available; and ii) recruiting utility and regulator pairs willing to develop and implement new approaches to regulation and utility business models.

- Because statutory issues are involved in many states, state legislators should be engaged through their national organizations, NCSL and NCEL.
- Potential state level allies include governors and their energy advisors and the NGA and regional governors' organizations, as well as state energy offices and their national association, NASEO.

Overview of Utilities 2020 First Phase Activities

Utilities 2020 began with the assumption that there are utility business models that better focus utilities on pursuit of more of society's values. Our assumption going into the project was that both how utilities do business and make money and how they are regulated to meet public interest goals could be improved.

To test the feasibility of a project to encourage new utility business models and regulatory incentives, we put forward the notion that current trends affecting investor owned electric utilities were sufficiently large scale and new to justify consideration of new dynamics within both utility firms and their regulators. As we organized an Advisory Council, interviewed CEOs and regulators, and sought general input we found agreement that a constellation of motivations currently impacting the utility business were sufficient to justify attention to changes to utility business models. The circumstances we presented included the following:

- Aging plant
 - Brattle Group identifies \$2 trillion investment over next 20 years
- Tougher environmental requirements
 - Criteria pollutants
 - Greenhouse gases
 - Coal ash
 - Water restrictions
- Flat to declining sales of electricity
- New technologies
 - Smarter grid
 - Distributed generation: solar, CHP, micro turbines
 - Electric vehicles
- Changing consumer requirements
 - Disintermediation by third parties
- Weakened industry financial metrics

In depth interviews almost uniformly produced interested correspondents, eager to be further involved. We were overwhelmed by offers of support and interest in participating. Many of those with whom we interacted, after discussing the case for

the project, immediately pressed us for recommendations about how utilities and regulators should change what they do. We take being pressed for the ultimate outcomes right away as the best evidence of the appetite for the project among key project constituents.

Instead of utilities having “wrong organizational goals” based on equity investment goals inherent in rate base, rate of return regulation, a better description, given the input we have received, would be that utility organizational goals could well be refined and redirected to additional and more productive ends. A new, broader package of incentives might well still include rate base, rate of return incentives, but clearer societal goals, improved communications and process, and better appreciation of risk management techniques and performance and outcomes metrics would be added to cost accounting and equity return incentives.

The Utilities 2020 Advisory Council

The project advisory committee serves several purposes: 1) as a source for ideas; 2) as an entree to decision makers and other thought leaders; and 3) as a sounding board for concepts developed in the project. The advisory board was chosen to be a microcosm of open-minded thinkers on multiple sides of the issues; their advice and counsel helped to guide the project to productive and acceptable recommendations.

As we set up the Advisory Council, we sought to involve thought leaders, representatives of regulatory commissions, utility CEOs, and to achieve a diversity of representation and thinking. We wanted to tap the credibility of a panel of real experts, to enlist them in helping us think through the issues, and to guide us to key contacts and institutions that would be critical to project outcomes. We asked them to be involved with us as we moved our feasibility study to completion and to consider being involved in our project over the long term.

Members of the Utilities 2020 Advisory Council¹

- John Bohn, GlobalNet Partners, L.L.C.

¹ The affiliation of each individual is identified in this listing. However, the members of the Advisory Council are members in their own right and the organizational affiliations are shown for identification purposes only. The positions taken by each member of the council do not necessarily represent the positions of their affiliated organization.

- James Newcomb and Lena Hansen, Rocky Mountain Institute
- Paul Bonavia, Tucson Electric Power
- John Nielsen, Western Resource Advocates
- Ashley Brown, Harvard Electricity Policy Group
- Sonny Popowsky, Pennsylvania Office of Consumer Advocate
- Ralph Cavanagh, Natural Resources Defense Council
- John Quackenbush, Michigan Public Service Commission
- Richard Cortright, Standard and Poor's
- Lisa Schwartz, Regulatory Assistance Project
- Peter Fox-Penner, The Brattle Group
- V. John White, Center for Energy Efficiency and Renewable Technology

The initial meeting of the Advisory Council was held in Denver on May 1, 2012. Nine of twelve members attended, along with three foundation representatives, three project staff, and Brent Gale of MidAmerican Energy Holdings Company. The meeting addressed utility futures, the case for changing regulation, an inventory of new practices, how the Utilities 2020 project would build a plan for continuation of its effort, and how the changes identified by the project could be institutionalized.

We are deeply indebted to our Advisory Council for their work with us on this feasibility study.

Research Results that support Utilities 2020

Part of our work on Utilities 2020 included analysis and reporting on issues and opportunities that could be brought to bear on the project's central thesis, that improved outcomes could be possible if utilities change how they do business and make money, and if regulation were to encourage utilities to change. Our research led to several publications noted below.

U.K. RIIO Model

In support of the project, we completed a white paper on the U.K. RIIO model. There, the regulator OFGEM has continued its previous policy of regulating financially, based on cost, through a price cap approach with a productivity factor. In the new regulatory scheme, "RIIO" stands for **r**evue set to deliver strong **i**ncentives, **i**nnovation and **o**utputs, and its name essentially summarizes goals and methods of the United Kingdom's Office of Gas and Electricity Markets, (or OFGEM)

in motivating utilities to adopt business models² that include more low carbon electricity generation, performance incentives, and larger stakeholder roles in regulation. Our RIIO research paper investigates how the U.K. regulatory model could apply to U.S. circumstances.

Publications

Publications

“Risk Aware Electricity Regulation: What Every State Regulator Needs to Know,” by Ron Binz, Rich Sedano, Denise Furey, Dan Mullen. CERES: April 2012

The CERES report is aimed at state regulators and deals mainly with issues of how regulators could incorporate consideration of risk in electricity regulation. It also identified the need for regulators to “think way outside the box” about new regulatory models and the incentives provided by regulation.

“Risk-Aware Planning and a New Model for the Utility-Regulator Relationship,” by Ron Binz and Dan Mullen. ElectricityPolicy.com. July 18, 2012.

This article was invited by Robert Marritz, editor of ElectricityPolicy.com, one of the leading industry journals. The Utilities 2020, with its goals, methods and initial findings was described in the second half of this 16-page article.

“Clean Energy Investments and Incentives: Choices for Investors, Utilities and Regulators” Ron Lehr, Clean Energy Vision Project, October, 2012. <http://www.cleanenergyvision.org/transition-plan-investments/> Written in support of a Clean Energy Vision for the western grid in the context of grid-wide transmission planning (www.cleanenergyvision.org) this white paper discusses how new utility business models and changed regulation could help to reduce investment risks and support clean energy investments required to meet clean energy goals.

Various State Regulatory Approaches

² OFGEM defines “business plans” as “The company’s forward looking expenditure plans/expectations which are submitted to Ofgem as part of the price control review process.”

<http://www.ofgem.gov.uk/Networks/rpix20/ConsultDocs/Documents1/rec%20glossary.pdf> We define “business model” below as: “how utilities operate and make money.”

Another frontier for additional analysis and research involved drawing both substantive and process lessons from the large body of experience, evidence, and literature about energy efficiency and demand management incentives. While some of these analogies were explored by the Utilities 2020 project, much of the work of drawing relevant lessons from the demand side and applying them to the supply side remains to be done. In this work, the tasks would be to draw out lessons about how development and application of demand side incentives might inform development of needed supply side incentives. For example, in a robust discussion of the role of decoupling at our Advisory Council meeting in Denver, we learned that both decoupling proponents and opponents are not shy about raising questions and distinctions from which all could learn more about what motivates utility managements to consider, and regulators to order, incentives to support desired behaviors.

Similarly, we have learned from interactions with our Advisory Council and others that a number of states have provided incentives for various projects in “one-off” decisions in dockets mainly concerned with renewable energy project approvals. While we have analyzed one of these, an Oregon PUC docket where a utility was given added earnings as an inducement to purchase power from a renewable energy development, (Oregon PUC #98-191 (UE 94-Phase II) Pacificorp Alternative Form of Regulation) there are others that remain to be researched in Colorado (Colorado PUC Incentives Docket No. 08I-113EG³ and, if rumors can be verified, in Nevada, and Oklahoma. We believe that there are other similar examples elsewhere that need research attention. Analysis of these dockets and orders could provide useful baseline and background information about how and why regulators have provided incentives to date. If dialogues about what could be done in the future go forward, it will help to know what has been done before, why, and how it worked out.⁴

³ See, https://www.dora.state.co.us/pls/efi/EFI.Show_Docket?p_session_id=47084&p_docket_id=08I-113EG

⁴ There is also a very interesting Oregon PUC docket that was aimed at dealing with utilities’ “make or buy” decision incentives, known in the docket as “self-build bias” UM 1276 (see: <http://apps.puc.state.or.us/orders/2011ords/11-001.pdf>) In the docket, the commission took comments and considered a number of alternative proposals to adjust what they found to be incentives for utilities to self provide. While the docket was closed without resulting in a new approach, the commission has reopened a companion docket, UM 1182, to consider changes to its bidding rules to address some of these same incentives. (see: <http://apps.puc.state.or.us/orders/2011ords/11-340.pdf>)

A final set of research tasks would be to get to the bottom of similar and related academic, think tank business models, regulatory proposals.

Interviews, Dialogues and Outreach

Interviews

Twelve utility executives were identified as possible interviewees. Of these nine were interviewed. Interviews scheduled:

- Paul Bonavia, Tucson Electric Power
- David Eves, Xcel
- Susan Story, Southern Company
- Greg Abel, PacifiCorp
- Bob Rowe, NorthWestern Energy
- Michael Yackira's Leadership Team, NV Energy
- Lewis Hay, Next Era
- Tom King, National Grid
- Ralph Izzo, PSE&G

What we heard from the CEOs:

- The CEOs uniformly reported their desire for 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 pointed out their concern about the inconsistent direction of state-level energy policy. Others noted that strategies are ad hoc and fragmented, rather than coherent and aligned.
- When questioned, 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." They agreed that higher firm efficiencies are possible and that these could function to offset higher costs expected over the next two decades.

- Several CEOs complained that regulators have an inadequate understanding of the utility business. One executive pointed out that some utilities are very good at project management and that regulators need to take more advantage of these skill sets. One CEO stated that 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.
- The CEOs were unanimous in wishing for certainty on climate policies and regulation of carbon emissions. Most seek a predictable climate policy and expressed a desire to move forward with decarbonization of their generation fleets.
- Most of the CEOs seek a 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: commission staff doesn’t accept that a utility might do something for the right reasons, and seems always to suspect hidden agendas.

Ten state utility commissioners were identified as possible interviewees. Of these seven were interviewed. In addition to these seven formal interviews, the Utilities 2020 principals interacted with numerous other regulators in other settings, such as NARUC meetings.

- Susan Ackerman, Oregon Public Utility Commission
- Phyllis Reha, Commissioner, Minnesota Public Utilities Commission
- Colette Honorable, Chairwoman, Arkansas Public Service Commission
- John Savage, Commissioner, Oregon Public Utility Commission
- John Quackenbush, Chairman, Michigan Public Service Commission
- Joshua Epel, Chairman, Colorado Public Utilities Commission
- James Tarpey, Commissioner, Colorado Public Utilities Commission

Here are some of the common themes that developed from these interviews and conversations:

- Most of the regulators expressed their primary concern that the challenges facing utilities, particularly the coming high level of new investment, 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.
- The regulators we interviewed were open to changes in the mode of regulation, but did not display urgency for making deep changes that we observed among utility executives. Several noted that there is very little opportunity to focus on the issues raised by Utilities 2020. Their efforts were more often focused on the day-to-day requirements of their position.
- 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.
- 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.
- Some commissioners expressed frustration with the adversarial process. They expressed hopes for more settlements among parties and more use of “non-adversarial” processes.

Of the twelve advisory council members, ten were interviewed.

1. Lena Hansen, Virginia Lacey
2. Ralph Cavanagh
3. Ashley Brown
4. John Nielsen
5. Lisa Schwartz
6. Sonny Popowsky
7. John Quackenbush
8. Peter Fox-Penner
9. Paul Bonavia
10. Richard Cortright
11. John Bohn, no interview
12. V. John White, no interview

Without repeating the earlier themes, here are some additional themes that developed in the interviews with advisory committee members and other energy advocates:

- While there is a well-developed suite of policies, based on a couple of decades of concerted effort that supports demand-side incentive policies for utilities, there is a paucity of thinking about supply utility incentives that will move the industry in the direction of clean energy. There are useful similarities, and significant differences, that remain to be explored between demand and supply side regulatory and incentive policies. Research, analysis, writing, and discussions will be required to explore both these dimensions of the problem and opportunity set.
- The interviews revealed divergence of opinions about the ultimate proper role of the utilities. Some believe that utilities have a vital “orchestrator” role in making change happen, while others prefer market approaches that minimize utilities’ roles. They note that monopoly providers are not usually considered as relevant sources of innovation and change.
- There is a deep gulf between the worlds of electricity policy on the one hand, and the capitalists who are focused on investment in the clean technology sector. The former sees how monopoly and monopsony contort electric markets; the latter assumes that new technology will make these market impediments irrelevant. A common language needs to be constructed for these two worlds to communicate. Appreciation of risk might be a common ground on which to start these communications.
- The intermediaries in regulation— the legions of lawyers and experts—have an incentive to preserve the *status quo* processes of regulation. They will need to be brought to more productive endeavors if new utility business models and regulatory incentives are to be implemented.

Dialogues

Regulator-Utility Dialogue, October 22, Denver

Utilities 2020 sponsored a day-and-a-half dialogue among regulators, utility representatives, environmental advocates and consumer advocates. Here are some of the themes and outcomes that emerged at the event:

- Participants reported that they “rarely have an opportunity” to engage in direct conversations about these topics.
- Utility representatives acknowledged that there is a problem with the regulatory structure and especially the incentives provided by regulation as practiced today.
- Regulators sought a better statement of the perceived problem. They defaulted to a “least common denominator” view: “we’re doing a lot with the problems we have in front of us,” explaining their lack of enthusiasm for upending their familiar, fully committed, regulatory world.
- When given the opportunity to craft “outside the box” regulatory systems during role-playing exercises, the players fell back to familiar positions and solutions.
- One non-utility participant seemingly summarized a common feeling: we’re doing OK now, but it’s hard to believe our regulatory system is capable of meeting the long term industry challenges.

“Tribal Elders” Meeting, December 15, Boston

Utilities 2020 was engaged by Energy Innovation: Policy and Technology, LLC, to contribute a white paper for a project, “America’s Power Plan,” funded by the Energy Foundation. The larger project seeks to develop a “companion policy manual” to accompany a recent DOE/NREL report that examines a high-penetration renewable energy future. A white paper explores connections between utility business models and progress toward an 80% renewable energy future.

As part of this project a meeting was held in Boston with several national experts. Attendees included Peter Fox-Penner, Ralph Cavanagh, Rich Sedano, Lisa Wood and Tom King, CEO of NationalGrid.

The purpose of the meeting was to explore connections between business models and a high-penetration renewable future. The five hour discussion ranged widely over the various topics. The meeting was conducted under the Chatham House rule, so that specific attributions cannot be made. Here were some of the important areas of discussion and agreements of at least several of the participants:

- There is a damaging lack of direction and purpose to energy policy at state and federal levels.
- There is an indispensable role for an “orchestra leader” for the grid, given its growing complexity and the numerous and growing sources and uses of

- energy the grid will accommodate. Utilities are best suited to the role of orchestra conductor and should evolve in that direction.
- The group rejected the model of a “hollowed out” utility, with disintermediation by other parties being the norm.
 - It is important to move toward a regulatory regime that provides better and clearer incentives to utilities.
 - UK RIIO model has a lot to recommend it, albeit with modifications. More generally, the group supported a “revenue cap” model with clearly described and measurable outcomes, coupled with incentives (positive and negative) for performance.

America’s Power Plan

In writing a separate paper for the “America’s Power Plan” effort, a discussion of relative utilities roles emerged. Adding that discussion here will give the reader a sense of how the Utilities 2020 project provided content to “America’s Power Plan” and in turn benefitted from the assignment. The utility role analysis that follows was first presented in the “Plan” paper.

A spectrum of possible utility roles emerges from Peter Fox-Penner’s book “Smart Power” and from discussions within the context of the Utilities 2020 project. These possible roles range from the potential for utilities to be minimally involved in addressing the motivating challenges presented above, to the potential for utilities’ maximum involvement. Since the country is so large, the number and kinds of utilities so various, and the situations by region, market, state, and locality so different, the outcomes are likely to vary across the entire spectrum. What we can say with certainty is that **one size won’t fit all**. Nevertheless, discussions about utility roles, and how business plans can reflect them are ramping up quickly, and we can see the beginnings of how these discussions might usefully lay out some constructive options.

Minimum utility involvement

Those who advocate for minimum utility involvement point out that utilities are the last place in business where innovation can rationally be expected to occur. Utilities, being creatures of engineering, reliability, and financial standards and expectations, with primary commitments to keep utility service reliable and costs reasonable, have few incentives to understand or take risks that are attendant on rapid rates of change or innovation. As single providers in their markets, these state monopoly franchise holders are far less responsive to the motivations for changes discussed above than would be other firms that face competitors who will angle for advantage in the face of challenges.

Utilities are also single buyers in their markets for energy generated by others, as well as for a number of other specialized inputs from suppliers of specialized power engineering services, grid equipment, etc. As “monopsonies” (single buyers in a market) they have strong incentives to prevent or limit market entry by competitors for functions they provide themselves, like those who provide disruptive generation like wind and solar, that challenge utilities’ traditions of reliance on fossil fuel for generation. Utilities are not disinterested bystanders when faced with business “make or buy” decisions. That most utilities are able to offload most fuel costs, risks, and liabilities onto their customers through fuel cost adjustments further tilts the market away from new renewable supplies.

There seems to be an assumption among certain economists, many customer segments, and some evidence from the organized RTO/ISO markets, that suggests that certain of the utilities’ lines of business can be opened to market forces to the benefit of consumers. Industrial customers, faced with increased utility costs around 1990, led efforts to restructure the electric industry. Results varied around the country, but left a legacy of more competition within the utility sector. Competitive entry in generation, for example, is found both in RTO/ISO as well as in markets where utilities under regulation are required to obtain generation in response to transparent planning and open bidding. Some states, like Wisconsin, have moved in the direction of requiring utilities to divest transmission into separate companies, which are then encouraged to compete to provide transmission investments and services.

In support of a minimal utility role, there is continuing discussion of how much the electric industry could be like telecommunications, where new technologies like cell phones have changed business realities of traditional regulated telephone companies so entirely that a regulated monopoly structure has nearly disappeared. A lot of customers on the winning side of that equation believe that technology in the electric sector will have the same impacts.

A good exposition of that point of view is found in the electricity chapter of Amory Lovins’ book “Reinventing Fire.” A number of the Silicon Valley investors in clean technology research and development and start up firms have this same outlook: Moore’s Law applied to the electric sector will cause the current utilities’ business to evaporate as customers find a myriad of new ways to get their service requirements met outside of current utility technology and business models.

Skeptics addressing this point of view emphasize that the best of restructured electric markets still struggle to meet public policy requirements for long term supply reliability, to mass capital for long term investment, and to meet current minimum renewable energy standards. FERC has announced massive fines resulting from enforcement actions against several firms that manipulated wholesale power markets unlawfully. For many in the West in particular, the Enron legacy of market manipulation in California still seems like a current threat that should prevent any discussion of, much less movement toward, expanding markets.

A minimum utility role has both supporters and detractors, but it faces utilities with the potential that their future will be one of a potentially dignified “death spiral” in which their business model is made irrelevant by new technology and customer demands, and they will be forced to raise their prices for their least desirable customers because their best customers depart to be served by other providers.

Middle way: Utility “Smart Integrator” or “Orchestrator”

Along the spectrum of potential utility degree of involvement, the middle way option is described in “Smart Power” as providing productive partnerships between utilities and innovator firms, so the utility role is one of facilitating technology and service changes but not necessarily providing all of them itself. The utility role here is one of bringing change along through their utility business processes. Utilities would maintain their strong engineering and reliability standards, but adapt and apply them to new technologies and service offerings. So new standards and changes to existing standards that incorporate new equipment, simplify and rationalize interconnections between new equipment and utility distribution and transmission grids, and integrate new generation into utility operations and markets would be needed.

With new standards, pilot and demonstration programs of new technologies and services would present lower risk profiles to both utilities and investors, and consumers might benefit from a rational and step-wise progression of new approaches from research and development making their way across what is now a valley of death for new ideas into utility pilot and demonstration programs that would prove up developers’ claims. Once demonstration project findings are in hand, utilities, investors, regulators and developers could turn toward mass deployment, and a variety of new technologies, business structures (like community generation ownership), and services would have clearer paths to markets.

The business skills to accomplish these tasks would be analogous to the conductor’s role in orchestral music. In this analogy, policy makers in both government and corporate policy roles will chose the music for the orchestra’s season, playing the music director’s role. Then the utility, standing at the orchestra conductor’s podium, would train the players to make a harmonious whole from the music selections and make the program available to the audience, the consumers. Some of the music might be classical, to appeal to those audience members who want to hear the familiar tunes to which they have become accustomed, played in a traditional manner. These customers might prefer utility based service offerings with few, if any, innovations and to face the least amount of choices they need to make. For those who want a more modern flair to their orchestra experience, the conductor would drop his or her baton on more modern scores.

Some utility customers want solar on their roof, or to own a wind plant and have it delivered by the utility to their computer server farm, or want to build and live in a

net zero energy home, or to have their military base be able to supply its own power when the main grid is down due to cyber attacks. All of these customer options would find a way into the overall music program that the utility conductor would facilitate and present. But the key in the “middle way” role would be to maintain partnerships with innovation providers that would benefit both partners and the customers they serve. This “Goldilocks” outcome, not too hot, not too cold, just right, probably has the most appeal to utilities, who can find a positive future in it, as well as to most regulators, who would be busy managing equity claims and cost of service issues in a much more complex setting, and to many stakeholders. Market oriented ideologues would find these messy compromises annoying at best or terminally unworkable at worst.

Maximum Utility Role: “Energy Services Utility”

While it is easy to imagine a utility role in which the utility is the ultimate enabler that “just makes it happen” it is harder to suggest how such a maximum utility role squares with the rates and levels of change that are suggested in response to the challenges now facing the electric industry. Envisioning a “maximum” utility role is particularly challenging given the fundamental critique of utility abilities and incentives that leads in the direction the minimal utility role: utilities are not change agents.

To make the case for settings in which the utility plays a central, expanded role going forward, there are circumstances that might lead a state legislature to construct a future in which utilities stay in charge, but with new marching orders. In places where utilities have enough political authority to sway legislative policy in their desired direction, one could posit this outcome. Perhaps in response to calamity of sufficient magnitude, utilities would be given the injunction by public policy makers to take care of rebuilding to solve a crisis. Rebuilding damage to utilities resulting from Sandy will be an interesting case study of some of these tensions.

The intersection of the maximum utility role with new technology presents similar conundrums. Perhaps the utility in this setting would control the computer platform for the “smart grid” allowing innovators add applications that meet customer requirements. Utilities might be encouraged to expand their business scope and scale by buying up innovator firms, acquiring their competitors, and making the most out of their special competence in managing large scale, complex, engineering construction projects. These outcomes might be strongly supportive of a rapid change, and would be consistent with a social agreement on the need to make an emergency move away from carbon based electric power.

Maximum role utilities might be expected to diversify their service offerings, as customers segment themselves into additional sets of service requirements. In response, utilities might find themselves serving military bases and other gated communities with utility owned solar or other generator supplies, high levels of

weather damage and cyber interference resilience and reliability, and the ability to drop off and rejoin the main grid depending on circumstances (or economics). Such a utility would target distributed generation to the most valuable places in the system.

Other customers might simultaneously prefer absolute least cost service, be willing to sacrifice reliability for lower cost, and be unwilling to spend the time or money to add much in the way of their own generation or end use control systems. A utility serving a variety of evolving and changing customer segments beyond the traditional residential, commercial, and industrial categories will be faced with creating additional value propositions to support each offering, as well as with more complex equity claims and cross subsidy concerns. Packages of services aimed at particular customer segments might result. These might be similar to those offered by telephone and cable companies combining phone, internet and television in one bill, and based on value of service pricing, rather than cost of service. A package of services approach could offer new services, define value and convenience for customers, add new utility revenue streams, and frame and provide services across a range of offerings and price points.

A utility at the maximum involvement end of the spectrum might be described as an end to end aggregator, doing business at the core of change, expanding its scope and scale, supported by public policy in its central role, and, hopefully, seeking continuous improvement of its economic, environmental, and financial performance. Some of what the maximum role utility would undertake would not be unlike those undertakings described in the moderate utility role, but would vary in degree rather than kind. In certain political and policy settings, which are bound to be encountered across the wide variety of utility experience in the U.S., a maximum utility role outcome could be the avenue of choice.

Utilities 2020 Issues and Findings

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 ubiquitous topic of "utility business models" actually resolves into several topics:

- What outcomes does society want from the electric utility industry?
- What role should utilities fulfill in the future?

- What incentives should law and regulation provide?
- How must regulation be modified to provide these incentives?

This list of questions illustrates the close connection between how utilities operate and make money (their business model) and the incentives provided by the legal structure of the industry and its regulation (the regulatory model). It is not productive to speculate about how utility business models should evolve until we have a fix on the outcomes that society wants and until we adjust regulation to enable and encourage those outcomes from the utilities. The following order of events should be considered:

1. **Determine desired societal outcomes.**⁵ These would typically be developed by federal and state legislatures and described in law. Unfortunately, explicit energy policy statements are absent in most cases, especially with respect to climate impacts. The contending outcomes include equity, sustainability, efficiency, energy diversity, energy ‘independence’, economic development, risk minimization, and environmental results, among others.
2. **Determine the legal and market structures under which utilities will operate.** This is a settled matter in most regions of the country, although evolution of market structures continues. For Utilities 2020 purposes, we considered market structure in each state or region as a given (vertically integrated, partially competitive, retail competitive, etc.) and moved to the issues of appropriate incentives.
3. **Derive and implement correct market and regulatory incentives.** This is the main work to be done: modifying regulation to induce the utilities to adopt business practices that lead to society’s desired outcomes. The diversity of market structures means that there will be a spectrum of regulatory arrangements, providing different incentives as appropriate to the market structure.
4. **Hold utilities accountable for the desired outcomes.** This set of actions includes defining baselines against which performance can be measured,

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- ⁵ A good example of such a list is the basis for the U.K. RIIO model:
 - customer satisfaction,
 - reliability and availability,
 - safe network services,
 - connection terms,
 - environmental impact, and
 - social obligations.

developing metrics and measurements and the data and analysis that applies them to utility performance, and determining what incentives are appropriate to support them. Attention here is to the links between the outcomes, incentives and performance. The challenge here to build continuity in the regulatory regime.

5. **Monitor, evaluate, and determine how utility business models evolve.**

As indicated by its position on this list, we expect the appropriate utility business models will be the outcome, not the input, to this process. Provided with incentives aligned to societal goals, we are confident that utilities will evolve in a way that responds to the incentives.

The efforts of Utilities 2020 have focused on the intersection between utilities, incentives and regulation. We observe that state utility regulation, which might have been adequate for the 1950s through the 1970s, remains rooted in concepts and practices that, while still important, are not adequate to the challenges of the 21st century. Without repeating the litany of changes that are reshaping the energy utility landscape, we conclude that regulation must shift and broaden its focus from monopoly-era economic issues, to a larger and more generalized set of issues that are best addressed through performance-based regulation.

Many observe that, as cost-of-service regulation has evolved in the last three decades, it has shed any realistic claim that it induces regulated companies to be efficient. One of the important roles of regulation, identified by James C. Bonbright in 1966, is the motivation for the utility to be efficient as a firm. 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 and could potentially be used to "fund" certain outcomes desired for utilities, such as movement towards cleaner generation resources and new consumer services.

These several considerations led Utilities 2020 to focus on three models for state regulation that have the potential to provide utilities with improved incentives and a feedback loop that will induce them to act in ways that further societal goals. Each of these models has (or could have) the essential elements of 1) explicitly described desired outcomes; 2) incentives for innovation and firm efficiency; and 3) a system of accountability.

The UK RIIO Model

Electric and gas distribution utilities in the United Kingdom are regulated under a comprehensive price cap regime called RIIO, which stands for “Revenue using Incentives to deliver Innovation and Outputs.” 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.

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.

Although the RIIO model might have to be significantly modified for use in the United States, its basic structure can provide appropriate incentives for utilities to move in the direction that society wishes them to do so. Further, the price-cap element will provide inducements to firm efficiency, making it possible to “fund” parts of the clean energy investment with higher earnings from efficiency gains.

The Iowa Model

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.”

While not technically a price cap regime, the Iowa experience exhibits a system that would provide 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. It is adaptable to emphasize clean energy goals by making them part of the periodic negotiations.

The fact the rates did not change over seventeen years is an incidental feature of this model. The particular energy economics in a state will determine whether prices could be kept constant over time. The important lesson from this model is its adaptability to emphasize the goals and incentives that the parties to the negotiation wish to achieve.

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.

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 this fragmented ratemaking process might be called “a grand bargain.”

This model combines 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.

Challenges to Success

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. While regulators must lead reforms, the effort must transcend individual commissioners and also become lodged in institutions that intersect with the regulatory agencies. A third real challenge is presented by the wide variety of circumstances, settings, market conditions, traditions, and outlooks across the country. The U.S. electric industry and regulation varies across a wide range.

With the levels of interest we have encountered in our outreach work it not surprising that many proponents of new utility business models and regulatory incentives are now emerging. Staying current with a rapidly changing and evolving set of ideas and players could challenge the capabilities of all these efforts. To establish awareness, unite efforts, and meet expectations for large scale change, a communications and coordination effort should be considered.

Conclusion

The **Utilities 2020** project explored the connected issues of evolving utility business models and changes to state utility regulation needed to enable the evolution of new utility business models. Through research and analysis, interviews with electric industry leaders, regulators, and interactions with experts and

colleagues the project defined a set of motivating factors that many agree cause concerns about whether the status quo, today's utility business models and the regulatory incentives to which they respond, are adequate going forward. The project found great interest in exploring options and alternatives among utility executives, industry experts, and interested stakeholders. State regulators were more cautious in their responses to the motivations and options discussed, but also willing to engage in discussions about potential changes and improvements. A number of ideas about new utility roles and endeavors, as well as several regulatory options were explored. The results of this twelve-month inquiry indicate that there is a need to consider new utility business models and regulation that supports them.