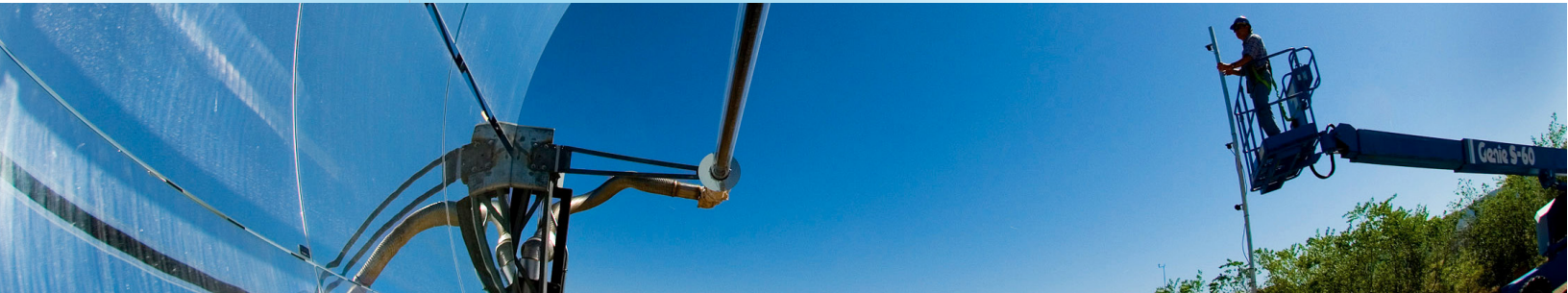


Transition Plan – Investments



Clean Energy Investments and Incentives: Choices for Investors, Utilities and Regulators



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Contents

Introduction	3
Toward New Utility Business Models	4
Rate Base, Rate of Return Regulation: Earn on Invested Equity	5
New Business Models: "Smart Integrator;" "Energy Services Utility"	6
Monopsony Power and Competition	6
Investment Opportunities and Risks	7
Integrating with Monopoly Providers	8
Utility Roles	9
Planning: Risk Aware Regulation	9
Make or Buy	10
Risk Allocations	10
Investor Perspectives, Risk Management, and Incentives	11
Conclusion	13

Introduction

Utilities and non-utility investors will need to raise and invest very significant funds in the electric system. The Western Grid Group's¹ Clean Energy Vision study² suggests that about \$200 billion will need to be invested in the Western Grid region by 2030. To achieve the CEV goal of 80 percent reduction in electric sector climate gas emissions over 1990 levels by 2050, the study suggests that "business as usual" approaches will not suffice. Both expanded use of the best policies and new approaches to utility business models and regulatory incentives will be required. With this amount of investment at stake over the next twenty years, it makes sense to understand how clean energy investments are handled today, what issues need to be addressed to support trends toward clean energy investment going forward, and how incentives might be appropriately structured to support new approaches.

This paper provides background on how electric utilities are challenged by today's circumstances, how and why they do business currently based on equity investments in generation facilities, and new business models they are considering. Many utilities are diversifying to include clean energy generation subsidiaries under their utility holding company structures. Other firms with interest in making clean energy generation investments are variously known as "independent power producers," "exempt wholesale generators," and owners of "qualifying facilities." These firms are joined in the non-utility sector by many new market entrants that are investing in demand side, distributed generation, and information and communications software, products, and services related to the "smart grid." The paper develops an analysis of the interactions among these sources of investment in clean energy options focused on how utility regulation and new business models can provide a path toward the future of clean energy investment in the electric sector.

¹ <http://www.cleanenergyvision.org/>

² <http://www.westerngrid.net/> The Western Clean Energy Advocates alliance is supporting the Clean Energy Vision across a variety of Western planning and decision making venues: <http://www.westerngrid.net/wcea/what-is-the-wcea/> Members of the WCEA include a diverse set of environmental and clean energy advocacy groups: <http://www.westerngrid.net/western-clean-energy-advocates-wcea-orgs/>

Toward New Utility Business Models

Electric utilities face significant challenges as they transition to cleaner generation sources. Aging power plants, air pollution-driven investment requirements, rising efficiency standards and program requirements, and meeting minimum renewable energy standards are pressing today. Coal plant retirements, smart grid deployment, electric vehicles, and carbon costs, risks, and liabilities are coming on quickly. These challenges confound simple traditional investor-owned utility company business models in which equity investments in generation plant earn returns authorized by state regulators. Earnings on equity, mostly invested in generation plants, provide these firms' predominant financial incentives. Mandatory reliability standards, increasingly stringent air pollution regulation and minimum renewable energy standards all lead to financial penalties if not managed properly, while there are few positive financial incentives to replace or augment incentives provided by utilities' earnings on invested generation plant equity. If today's challenges call for change, today's incentives call for stability and caution. Utility managers and their regulators confront a collision between the past and the future.

A transition to cleaner energy is popular with the public and with public policy makers, so much so that a majority of states have adopted minimum renewable energy standards. Most utilities have acceded to the notion that they have some role in increasing their customers' energy efficiency, despite the outcome that as consumers cut wasteful electricity use, utility revenues and profits can decrease. Purchasing contracts for output from renewable energy projects does not provide profits for investor owned companies because the utility is not making an equity investment on which it can earn a return. The independent power producer is making that equity investment instead. To add insult to this perceived injury, some ratings agencies treat IPP contracts as equivalent to debt. This weakens utility balance sheets, adding to the utility managers' burdens. To keep their equity margins in line with financial analysts' and regulators' expectations, managers would need to raise more equity capital to offset the debt burden of IPP contracts treated as debt. New transmission is required to access remote renewable energy resources, and while the equity invested in transmission is substantial, it is not at the scale where it can completely replace the equity earning scale of current utility generation investments. Aging generation fleets nearing retirement require air pollution upgrades, which in many cases will add more than current book values of generation plants, bringing into question the prudence of spending so much to upgrade old plants. Early retirement of this plant in service can take with it potential earnings.

For these reasons some utility companies, both investor-owned and publicly-owned, are actively considering new business models. These discussions are being held within companies' managements and boards of directors. There is little public discussion, nor are regulators engaged. This is uncharted territory. **Industry literature is devoid of detailed proposals for new business models, or supporting regulatory incentives addressing bulk power supply.** By contrast, dozens of papers and articles support changing utility business models and incentives for utility engagement in demand side management and efficiency endeavors.

While this paper deals mainly with traditionally regulated, vertically integrated investor owned utility companies, utilities in restructured markets and publicly owned utilities (cooperatives, municipal and public utility districts and similar entities) also have to respond to today's challenges that require significant capital investments.

In restructured markets, utilities provide wires services that transmit customers' chosen electricity supplies to them, along with necessary metering, billing and administrative services. As some states start to erect policies within these markets to supply more clean energy (and address the lack of long term investment incentives found in short term marginal cost based market structures) they are exerting more policy pressure to which investment will need to respond. While publicly owned utilities lack the same financial pressures to earn shareholder returns felt by investor-owned firms, they operate similar business structures and respond to customer-owner pressure to keep costs low and avoid risks, which most interpret as a call to stay with what works today. More analysis than is provided here should be aimed at utilities in restructured markets and should be applied to publicly owned utilities.

Rate Base, Rate of Return Regulation: Earn on Invested Equity

Regulators set prices for monopoly utility electric service by starting with utility books of accounts. The accounting basis for electric utilities is provided by a Uniform System of Accounts, required of all utilities by the Federal Energy Regulatory Commission and used by all state economic regulatory agencies to define costs. These accounts itemize all investments and expenses of the business. To set rates, regulators compare utility firms to determine whether levels of expenses and investments are prudent, and to set authorized returns on invested equity sufficient for the utility to attract equity investors. Prudently incurred expenses, debt coverage, and authorized equity returns make up rates that consumers pay. Returns on equity investment provide the basic financial incentive for utilities to invest capital in plant to serve consumers. In turn, earnings on equity establish the fundamental regulated utility business proposition to which utility managers respond: invest equity, earn a return.

Given the enormous investments embedded in thermal generating plants, as contrasted with costs of administration, local distribution, and transmission assets, protecting generation assets from declines in value is a prime motivator for utility managers. However, this incentive is at odds with the current drive in public policy for cleaner electricity, because it confronts advancing technologies across a spectrum of cleaner generation options, and it confounds the turnover of billions in assets that need replacement. Business as usual suggests continuing to operate ageing fossil fuel power plants, where retrofits provide poor investment return prospects. A massive shift to natural gas, based on shale gas produced by hydraulic fracturing, is fraught with risks. World gas prices are multiples of U.S. domestic prices, and market forces will draw these extreme price differentials together over time. Gas production stands indicted with some serious environmental costs and risks attendant on drilling and well completion mistakes, water demand and pollution, and methane and volatile organic compound emissions. Natural gas is a fossil fuel. Burning it results in emissions that cause climate change and result in weather extremes and damages. As these costs are internalized into gas prices, prices will rise. Some believe that the

long history of cyclical prices for natural gas has come to an end with large shale gas production. If it has not, then consumers are at risk for the next price spike, so long as regulators allow gas prices to be absorbed solely in consumer rates through energy cost or fuel cost adjustments to rates.

New Business Models: "Smart Integrator;" "Energy Services Utility"

Some consultants who provide strategic and management advice to utilities are suggesting to their clients that the "earn on equity" business model be augmented, or replaced, with new models that emphasize integration functions, new services and new income sources. For example, in his recent book *Smart Power*, Peter Fox-Penner proposes "Smart Integrator" and "Energy Services Utility" business models. These organize utility functions around new value propositions and new lines of business for, respectively, deregulated and vertically integrated utilities. Fox-Penner's analysis, however, is almost completely addressed to consumer-side efficiency and demand management functions on which there is already a large amount of thinking and analysis. He does not address how the bulk power side of the utility, where running forty-year-old coal plants is today's business imperative, can be changed to capture the diversity and other economic and public benefits inherent in, for example, renewable energy generation.³

Monopsony Power and Competition

In current circumstances, utilities are granted monopoly franchises to be sole suppliers of utility service within defined geographies. Most people are familiar with this business structure, and the exercise of state regulation to limit monopoly surcharges on customers who have no, or few effective, alternative suppliers in this specialized market. But few appreciate the roles and incentives attendant on utilities' monopsony incentives, which flow from utilities' market power over their suppliers. Utilities are the only buyers of bulk power produced by other generators, so they have power to control these suppliers, unless this power is adequately regulated. Utilities use their monopsony position to keep other suppliers out of their markets. Monopsony power allows utilities to squeeze suppliers so that most of the value in their deals ends up on the utility side of the ledger, leaving suppliers with just enough value on their side of the deal to stay in the business of supplying utilities, since utilities may need a viable supplier market at the end of the day.

Utility regulators have a century or more of experience regulating monopoly rent-seeking behaviors and protecting utility customers from such excessive costs, those thought of in today's regulatory approaches as being beyond the cost of doing business together with a "reasonable" opportunity for profits. Much less experience is available for regulators to draw on with regard to regulating monopsony utility

³ Fox-Penner does suggest that regulators be "certified" in the sense of certification that would follow advanced training, recognizing that the tasks facing regulators are formidable. For a CEO discussion on related topics, see: EEI, "Electric Perspectives" at pages 52-56 <http://www.eei.org/magazine/EEI%20Electric%20Perspectives%20Article%20Listing/2010-09-01-EXCHANGE.pdf>

incentives. Only since the Public Utilities Regulatory Policies Act inserted “Qualifying Facilities” (QFs) into the utilities’ generation equation, and required regulators to set “avoided costs” as a way of compensating QF generation have they faced these issues. The results have been all over the map. Some regulatory jurisdictions have achieved workably competitive wholesale generation bidding markets, some oversee utility negotiations with generation suppliers that work in the public interest, and some set avoided cost qualifying facility rates that provide generation supplies at just and reasonable consumer costs. But that experience is by no means universal, and many regulators struggle with these tasks, achieve uneven results, and their inability to get this part of their work right raises investment risks, and resulting costs, that could be avoided.

Investment Opportunities and Risks

While utilities are struggling to move from business as usual, which would see them operating ageing coal plants for the next twenty years, investment capital is flowing to new demand side, energy efficiency, distributed generation, and combined heat and power resources.⁴ These investment opportunities seek to take advantage of new technologies and services to provide electricity that is cleaner, more efficient and reliable, and potentially lower cost for consumers. The investment bet here is that consumers will benefit from capital investments in these new technologies and services, since they will replace the need for fossil fuel, with its attendant costs, risks, and liabilities. If these investments turn out to provide their claimed benefits, then consumers would also save money in the long run, after the initial investments in cleaner and more efficient approaches are paid off, and their electricity and heating bills are no longer so extensively affected by the fossil fuel treadmill of fluctuating prices and large costs and risks that are not included in electricity and heating prices.

Western Grid 2050 and many similar studies show that it is now feasible to provide consumers with more secure and sustainable electric services and reduce electric sector greenhouse gas emissions. A key question for policymakers and the public is how much of the investment needed to effect this transition should be made by incumbent monopoly utilities, and how much should be made by new, non-utility providers of electric services. Traditional utility financing offers the prospect of lower cost capital, while venture capital financing of many innovative energy technologies can make new sources of capital available to build an orderly transition to a clean energy future.

Regulators in many states have authority to supply utilities with performance goals that would allow them to pursue innovations in sectors where today investment is bottled up by utility and regulatory barriers and perceptions that risks are unacceptable to support investment. Simple uncertainty about policy and direction

⁴ There are many examples of investment opportunities in energy efficiency, demand responsive resources, distributed generation, and combined heat and power, including companies that are raising and risking capital to compete in or alongside regulated electricity markets, such as EnerNOC, Itron, Solar City, Solar World, and SunPower.

can be a barrier to new investment, as investors have a hard time making due diligence judgments about investments related to utility markets because of uncertainty about how much of their new products and services will be allowed to enter today's utility-dominated markets. Utility monopoly-protecting behaviors can block out new entrants, or delay their market entry. Some examples include drawn out and expensive interconnection studies and requirements and risk allocations that do not balance risk and reward for new entrants. Utilities can delay timely provision of transmission facilities and services to protect the asset values of their owned generation equipment and exclusive access to captive customers. Some utilities use their considerable political, lobbying, and regulatory assets to prevent, limit, or reverse renewable energy standards and efficiency policies and programs. New market entrants can rarely counter these expressions of utility legislative, political, and regulatory power that can result in utility-friendly policy outcomes. Finally, utilities can have large impacts on how costs are allocated, on how cost are recovered in rates, and on rate structures themselves.

Regulators can also set performance goals to give utilities incentives to support inclusion of new entrants into utility and adjacent markets. The goals could address outcomes in addition to "least cost" that directly benefit consumers: generation diversity, security, reliability, environmental performance, and innovation. Non-utilities could be invited to bid to provide new products and services that provide these benefits, and utilities could bid to provide the same services. Utilities could still be paid for provision of wires and delivery services while decentralized networks, projects like community solar gardens, and smart grid pilot and demonstration programs, are worked out. With regulatory performance goals and incentives, utilities could start to move toward "Smart Integrator" or "Energy Services Utility" business models. The transition could bring new sources of capital, new investors, improved technology, and innovative services into markets while utilities have an opportunity to transition their business models, and learn to compete.

Integrating with Monopoly Providers

Another market reality that challenges new information and communication technology providers in particular is that utilities want to control what new products and services are interconnected with their electric systems. Often reliability concerns are raised as one expression of these concerns. How these new innovations intervene between utilities and their customers has to be another critical utility concern. Useful steps here would be to segment the markets for new information and communications technology services to identify how they relate to physical utility interconnection, which ones depend on new tariff structures, how they are impacted if utilities drive toward fixed rather than variable cost rates, and what reliability, security, and privacy concerns are raised. Tracking the resulting service segments or "buckets" to the National Institutes of Standards and Technologies smart grid framework might provide some insights about how emerging standards will enable widespread market deployment, and tracking segments to NIST standards development timeframes might help to clear up what needs to happen sooner, rather than being left for later.⁵

⁵ <http://www.nist.gov/smartgrid/>

Utility Roles

As "smart integrator" and "energy service" utility business models start to emerge, utility roles will come under additional scrutiny. Some believe that, because utilities are one of the last large-scale engines of public policy achievement left in our increasingly privatized economy, regulators should encourage them to diversify into adjacent markets where their organization and financial abilities can be enlisted to meet society's clean energy goals. In fact, some utilities have become major national players in developing and operating renewable energy projects.⁶ Regulators who are providing incentives to expand demand resource and energy efficiency programs are other examples of opportunities to focus utility investment on lower cost, lower risk technologies.

By contrast, others see utilities' monopoly power and incentives as inherently unfriendly to clean energy outcomes. In this view, utilities' monopoly habits prevent expansion of both demand and supply side clean energy options, hamstringing technology and business organization creativity, and fence out growing interest and investment in the new technologies, products, and services that consumers really want. To advance this point of view, regulators would prevent utilities from diversifying horizontally into adjacent clean energy markets, and actively limit expansion of their business models into either "integrator" or "service" functions. In this view, utilities should not be allowed to provide energy services like efficiency programs or renewable energy projects. Advocates of this approach suggest that the less utility involvement in clean energy goals, the better. But since this point of view acknowledges that utility reliability and wires functions are probably irreducible minimum monopoly functions, then even here regulators will face challenges wherever new technologies and new firms affect system reliability or interconnect with grids and their operators. So whatever point of view might prevail about the relative roles of utilities as opposed to non-utility suppliers, interactions between the two sectors will need to be policed, and the topics for that engagement must be addressed.

Planning: Risk Aware Regulation

The recent CERES paper "Risk Aware Regulation"⁷ provides an excellent overview of how regulators can take risks into account when making decisions among various resource choices. By explicitly recognizing risks and factoring them into decisions among resource options, regulators are encouraged to avoid making large scale

⁶ NextEnergy, a Florida Power and Light entity is the largest U.S. owner of wind plants. MidAmerican, a utility holding company owned by Berkshire Hathaway, has entered the market to provide renewable energy to other utilities.

⁷ "PRACTICING RISK-AWARE ELECTRICITY REGULATION: What Every State Regulator Needs to Know How State Regulatory Policies Can Recognize and Address the Risk in Electric Utility Resource Selection," Ceres Report, April 2012. Authored by Ron Binz and Richard Sedano, Denise Furey, Dan Mullen <http://www.ceres.org/resources/reports/practicing-risk-aware-electricity-regulation/view>

investment mistakes, which are more likely in the absence of attention to risk. The paper also draws attention to the variety of risks that must be accounted for in planning and decision making. Misjudging future levels of demand, choosing the wrong generation technology, inattention to the timing and sources of project financing, construction project planning and implementation failures, operations and maintenance mistakes, and assuming the wrong fuel costs are all examples of the multitude of risks that must be considered. Decisions about whether to invest in pollution control equipment for decades-old coal plants are presently facing many utility managements, boards of directors, and regulators. The CERES paper suggests that careful attention to risks, longer planning horizons, and consideration of a wider range of reasonable options will help prevent large-scale mistakes.

Make or Buy

Given its incentives to self-supply provided in the form of equity returns on investment, a regulated utility is not a neutral decision maker as between its own projects and those provided by others. All else equal, it will prefer to "make" rather than "buy" since its profits are associated with its investments. Bringing a degree of public interest scrutiny to utility "make or buy" decision-making is at the heart of the regulatory challenge in this area. Should a utility build its own generation plant, or contract with an independent power producer for the electric output of a new generator? Is the utility better off developing its own wind power project, or buying the output from a firm that specializes in wind development?

The public interest requires regulators to achieve a balance in which financially healthy utilities have adequate invested equity both to support ongoing operations and to provide an equity cushion against which debt can be raised to address extraordinary needs, such as rebuilding after natural disasters. It is also a legitimate goal of regulation that consumers should gain the advantages of new technology, diversity of ownership, specialized knowledge, and new business approaches, and the benefits of risk mitigation that are available when a utility enters into a well-structured power purchase agreement with an independent generation supplier. The trick is to find and police an adequate balance between the two approaches.

Risk Allocations

It is also important for regulators to consider who should bear what risks, particularly as between a utility that undertakes a new generation project, and a supplier that builds and operates a generator, selling power to the utility. In the case of a utility that undertakes a generation project, there is some contingent risk that utility customers will face higher costs and rates if any risk turns into an unanticipated cost. When a utility contracts for power from an independent provider's generation project, many of those risks can be allocated to the independent company and, with proper power purchase agreement documentation, utility consumers can be insulated from a variety of project, financial, and other risks. However, as risks are shared between the independent provider and the utility, so are rewards, and costs and prices of projects will reflect risk allocations.

Some commissions have explicitly ruled on the balance of risks and rewards as between utility and independent supplier projects, finding that a balance should be struck, that a zone of reasonable market allocation between utility and independent projects exists, and that some variation in market allocation over time could be entertained as conditions warrant. For example, in its 2008 resource plan order, the Colorado PUC denied Public Service Company the 100 percent market ownership in new generation resources they had initially sought. Instead, the commission found that “. . .both utility and IPP ownership provide significant benefits to ratepayers(. . .) . . .because “. . .they keep each other sharp through competition.”⁸ The commission recommended a “soft target” approach that would result in utility ownership percentages in the 40-60 percent range, depending on outcomes of actual bids as evaluated by an independent evaluator.

Within bid evaluations, contract negotiations, interconnection agreements, and transmission provision for new projects, state regulators will find that utilities have many opportunities to exercise more or less obvious influence on outcomes of their “make or buy” decisions. While it is of first order importance for commissions to lean toward transparency so these issues are aired in public fora, countervailing confidentiality claims also must be considered. For a reasonably competitive market to exist, in which projects can be bid to utilities with some assurance of fair dealing, competitive information about pricing, competitive practices and advantages, and financial and other commercially sensitive information must be respected. Boundaries for sharing this kind of information must be erected and maintained. When these challenges are met with reasonable success, successive bids should attract more interested parties, more bids should be made, and prices should be forced to market levels by the competitive contest among eager contestants. Consumers will benefit if these conditions can be achieved and maintained.

Investor Perspectives, Risk Management, and Incentives

Where utilities’ incentives to favor their own investments are addressed by “heads up” regulation, investor perceptions of risk, and required returns on investment associated with those levels of risk, are likely to be reduced. In the short term, regulation that allows utilities to profit unduly from using their monopsony power to the disadvantage of their suppliers, by squeezing profits to the utility side of deals, may appear to work to the benefit of both utilities and ratepayers. But in the long term, these behaviors wreck markets for suppliers. Suppliers will refuse to participate in such markets, or will mark up the costs of their proposals to include the adverse financial impacts on them from unconstrained, or poorly constrained, monopsony utility behaviors. In the long run, and in the presence of adequate regulatory scrutiny and control of monopsony incentives, both investor returns and resulting project costs should be less in the presence of adequate regulation of utility monopsony incentives, than in their absence. “Heads up” regulation applied to utility “make or buy” decisions should result

⁸ Colorado Public Utilities Commission, Decision No C08-0929, Docket No. 07A-447E “Phase I Decision” August 19, 2008 at pages 55-56.

in lower prices and better outcomes for consumers. One indicator of such regulation is employment of an independent evaluator. An independent evaluator analyzes competing proposals but does not have a financial stake in the outcome of its recommendations. Independent evaluators can help commissions approve planned portfolios of resources, which can then be turned over to utilities for negotiations and contracting.

In at least one case,⁹ a commission has explicitly suggested that utilities could be rewarded for their achievement of workably competitive generation outcomes as between their own project and those of other suppliers. The Oregon commission found that a bias does exist for utilities to favor their own projects, since they earn a return on equity invested in these projects. But the commission also found that consumers were likely to benefit where utilities made fair decisions between their own projects and those of others. It also found it impossible to quantify the potential consumer benefit.¹⁰ The commission reopened its docket concerning bidding rules and reserved their right to employ stronger actions by an independent bid evaluator in cases "... when a utility self-build option is included in the utility's short list."¹¹

Another form of utility incentive provided by many states is to allow utilities a presumption of prudence for acquisitions that carry out an approved plan. The presumption follows commission findings that a planned portfolio of resources bears reasonable benefits and risks when compared to costs that are estimated in planning of acquiring and operating those resources over time. Since planning has defined choices and the commission has vetted the plan, a utility can proceed to acquire those resources with assurance that their acquisitions will not be tested for prudence if they diligently carry out the plan. This approach limits utilities' regulatory exposure and thus reduces overall risk. Less risky investments require lower investor returns, resulting in lower utility borrowing and equity risk premium costs, and ultimately result in lower prices for consumers. Whether this effect of planning and acquiring resources at less cost and risk can be isolated, quantified, or shared as an incentive between investors and consumers, is at the very edge of the regulatory envelope in current practice.

⁹ "In the Matter of the Public Utility Commission of Oregon Investigation Regarding Performance-Based Ratemaking Mechanisms to Address Potential Build v. Buy Bias," Docket No. UM 1276, Order No. 11-001 (Jan 3,2011). See also, "Request to open an investigation regarding performance-based ratemaking mechanisms to address potential build-vs-buy bias." Oregon PUC Docket No. UM-1276, opened August, 2006.

¹⁰ See, Oregon PUC ORDER NO. 11-001, Entered 01/03/2011 at: <http://apps.puc.state.or.us/orders/2011ords/11-001.pdf>

¹¹ Oregon PUC, UM-1182 (Reopened), "Investgation Regarding Competitive Bidding," at page 4. See: <https://apps.puc.state.or.us/orders/2011ords/11-340.pdf>. Oregon commission now has evidence in their reopened UM-1182 docket that suggests that such quantification is possible, which could lead to sharing quantified benefits between utility shareholders and consumers, thereby constructing an incentive for utilities to achieve outcomes that balance "make or buy" decisions made by utilities in the public interest. See, for example, NIPPC's Comments regarding bid price adders at: <http://edocs.puc.state.or.us/efdocs/HAC/um-1182hac16525.pdf>

Conclusion

This paper provides background on how electric utilities are challenged by today's circumstances, how and why they do business currently based on equity investments in generation facilities, and new business models they are considering. Monopsony incentives, and make or buy issues are discussed, and potential regulatory approaches and incentives are proposed. More analysis is needed on investment opportunities in clean energy technologies, including consideration of how new incentives, risk management, and reward sharing could increase the velocity of change in the electric sector. These ideas can also be applied to non-profit utilities, including public, municipal and cooperative organizations, and utilities in markets restructured to allow for consumer choice. Opportunities to attract new sources of investment in clean energy options justify sustained focus on evolving regulatory frameworks and developing new business models capable of guiding transition to a more secure and sustainable energy future.