



# EFFICIENCY AND RATEMAKING: ALIGNING THE INTEREST OF UTILITIES AND THEIR CUSTOMERS

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## **About the South-central Partnership for Energy Efficiency as a Resource (SPEER)**

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## I EXECUTIVE SUMMARY

While many states have taken actions to encourage energy efficiency, standard ratemaking practices for regulated electric utilities in the United States result in incentives for utilities to encourage their customers to increase consumption, rather than to reduce it. A number of rate-making innovations, however, have evolved over the last few decades to align the interests of utilities and their customers, and minimize conflicts with government mandates, such as energy efficiency. We find the utility regulatory strategy that has the greatest likelihood of fostering energy efficiency combines a clear state policy goal with a ratemaking framework that addresses the legitimate concerns of the utility. Despite a dizzying array of possible approaches to accomplish the second part of that formula, there are three fundamental components: procedures for timely recovery of energy efficiency program costs by utilities administering the programs, for reducing the lost revenue risk through decoupling, and providing opportunities for increased earnings from effective management of energy efficiency programs that create net benefits for society.

Electric utilities, and transmission and distribution utilities in particular, have a high level of fixed costs, but recover most of their costs through volumetric rates, that is, rates that are charged on a dollar per unit of consumption basis. The incentive to encourage consumption occurs in several ways.

First, because the primary rate recovery mechanism is through a volumetric rate, revenue rises and falls in direct proportion to customers' consumption. Second, the standard rate formula compensates a utility for its reasonable expenses and provides a regulated rate of return on its investment in capital assets. To the extent that additional consumption results in the need for new infrastructure to serve customers, the utility is able to increase its return. Simply stated, increased consumption leads to increased investment, which leads to increased profits.

Finally, the cost and time required to conduct a rate case at a regulatory commission results in lengthy intervals between rate changes. To the extent that increased consumption occurs in these intervals, and utility revenue growth exceeds increases in the utility's cost of supplying the additional demand, the utility benefits from the regulatory lag.

Thus, traditional rate regulation inevitably gives rise to conflicting objectives for the managers of an electric utility. For example, managers have an incentive to invest in capital assets, because such investments are a major source of utility profits, but they also must demonstrate to regulators that any investments are prudent and the assets are "used and useful" in providing service to customers. Government energy policies that are administered by utilities, such as requirements to conduct programs to improve customers' energy efficiency, may conflict with the managers' objective to increase sales and revenue.

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Various alternative ratemaking approaches have been adopted in a majority of states to counteract the inherent incentive for utilities to work for increased consumption in traditional ratemaking regimes. Many of these alternative approaches attempt to incentivize regulated utilities to improve customer service, reliability, operational efficiency, and more efficient use of energy and capacity; in the absence of a regulatory driver, a utility has little financial motivation to improve outcomes in any of those areas.<sup>1</sup> Performance based ratemaking (PBR) mechanisms or other innovative ratemaking approaches have been developed by regulatory commissions to address these conflicts. The approaches include:

- Revenue regulation, which “decouples” the allowed revenue collected by the regulated utility from the sales volume, thereby eliminating the disincentive to conduct customer energy efficiency programs.
- Lost revenue adjustment mechanisms that allow a utility to recover reductions in revenues due to energy efficiency programs.
- Performance targets, in which rewards and penalties are established for identified areas of utility performance.
- Rate freezes coupled with performance targets, which provide a utility an incentive to control costs during a period in which it may enjoy the benefits of regulatory lag, if it meets performance standards in identified areas.

Absent some innovative rate approach, adopting an energy efficiency program results in increased costs and reductions in customers’ demand and, accordingly, adverse financial consequences for a utility. There are three aspects of energy efficiency programs that have ratemaking implications:

- (1) the utility incurs costs to conduct the program;
- (2) the utility loses revenue as a result of reductions in sales due to improved energy efficiency;
- and,
- (3) in general, utilities have no financial incentive to develop the expertise to manage a program to encourage customers to improve their energy efficiency.

Traditional ratemaking may address cost recovery, subject to regulatory lag, but it does not address the remaining issues.

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<sup>1</sup> There are many other drivers (public relations, desire to improve one’s community, etc.) but no financial drivers that incentivize these kinds of behaviors and outcomes.



In an era of small budgets for energy efficiency programs and gradual impacts from building codes, appliance standards, and emerging technologies, failing to address these issues may have had minimal financial impact on the utility. Today, however, many utilities operate in an environment of large and growing energy efficiency programs and massive impacts from codes, standards, and new technologies (e.g., LEDs, solar PV, etc.) that are having a material detrimental impact on utility sales and

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revenues. Some utilities are also operating in an environment of economic stagnation, which results in declining sales. In the recent past, as energy efficiency and other demand side measures substantially reduce electricity consumption in some regions, state regulators began addressing rate issues in innovative ways. While the approaches vary, the goal is similar: give utilities an incentive to accelerate energy efficiency and emerging technologies rather than work against them—and do so in a way that also improves customer satisfaction and lowers overall costs to consumers.

A comprehensive approach to cost recovery for energy efficiency programs would include at least three regulatory aspects:

- (1) A decoupling mechanism designed so that the “throughput incentive” no longer remains;
- (2) Timely cost recovery, through a special rate or rider for efficiency program costs; and
- (3) A performance-based incentive which would allow the utility to share the net benefits of the energy efficiency program or to include a portion of the program costs in rate base.

Regulators, particularly in states with large energy efficiency programs, have begun to address the issue of full cost recovery for program costs and lost revenues. However, utility management typically has other legitimate concerns. Why would a utility embrace a large state-mandated program that requires significant expertise and thoughtful management but does not contribute to its profitability? It may be necessary to adopt incentive mechanisms that make increased energy efficiency a “profit center” for the utility. The optimal regulatory strategy may be a clear state energy efficiency policy, a procedure for timely recovery of energy efficiency program costs, reducing the lost revenue risk through decoupling, and creating opportunities for increased earnings from effective management of energy efficiency programs that create net benefits for consumers.

## **II. TRADITIONAL RATE MAKING**

By law and long-standing practice, the cost of providing service is the standard of reasonableness for public utility rates. Under the cost of service standard, the rates approved by a



commission are expected to recover the company's prudently incurred cost of providing regulated services. The standard rate formula sets rates based on a utility's reasonable expenses and a reasonable rate of return on its investment in capital assets. Rate proceedings are held to determine the prudent investment, cost of capital, labor and other costs, and other inputs used to calculate rates. A utility's rate filing includes information on historical capital investment, expenses, and customers' consumption or estimates of future investment, expenses, and consumption.

The regulatory rate proceeding usually begins when a utility files a rate application, requesting a rate increase. Alternatively, the regulator (sometimes at the request of customer groups) may initiate a case to change rates if rates are believed to be excessive. Interested parties (interveners) are permitted to participate in the proceeding; interveners usually include consumer groups, large industrial customers, the state's public advocate, and environmental organizations. Interveners may participate by obtaining information concerning the utility's request, submitting comments to the regulators, and participating in any negotiations and hearings that occur. The regulatory commission typically holds public hearings or an evidentiary hearing (or both) to review the case before issuing a decision.<sup>2</sup> The end result of the proceeding is a set of rates for distinct customer classes, which are based on the costs allocated to each class divided by a fixed volume of sales or peak demand for each group of customers.<sup>3</sup> Typically the bulk of the costs are recovered through rates that are based on a dollar per kilowatt-hour and/or dollar per kilowatt rates, and, once they are established, the utility can gain additional net revenue from growth in customer demand or reduction in its operating costs, until the rates are reset in the next rate proceeding. The interval between rate proceedings is referred to as "regulatory lag." It can work for the utility if revenues increase faster than costs. Regulatory lag can work against the utility, however, if there is significant inflation in input costs between rate proceedings, or customers' aggregate demand falls. Because the rate-setting process is expensive and time-consuming, and the outcome is uncertain, a utility typically files a rate proceeding at infrequent intervals, based on a clearly demonstrable need.

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The regulatory process inevitably gives rise to conflicting objectives for the managers of an electric utility:

- The fact that return on investment is a major source of profit (perhaps the only reliable source) means that managers are incentivized to invest in capital assets to provide service to customers.

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<sup>2</sup> James Van Nostrand and Erin Honaker, "Preserving the Public Interest Through the Use of Alternative Dispute resolution in Utility Retail Rate Cases," 27 *Pace Environmental Law Review* 227, 228-232 (2009)

<sup>3</sup> Ken Costello, *Future Test Years: Evidence from State Utility Commissions*, National Regulatory Research Institute (October, 2013).



This incentive is restrained by regulatory standards: the investment must be prudent and the asset must be used and useful in providing service.

- During the period between rate proceedings, a utility has an incentive to reduce costs, in order to maximize profits. At the same time, cost reductions that result in a degradation of service may generate customer complaints and unwanted attention from regulators.

Conflicts for the managers of an electric utility may also arise as utilities are used by federal and state government as vehicles to meet energy policy objectives:


- State-mandated energy efficiency programs may create requirements for utilities to carry out programs that reduce their customers' consumption. The reduction of consumption may reduce the need for additional capital assets to provide service to customer and, in the interval between rate cases, will reduce the utility's revenue and profit.
- Similarly, programs to facilitate or incentivize customers' use of distributed generation create utility requirements, but they also result in loss of revenue and lower profits, in the same way that energy efficiency programs do.
- Both energy efficiency and distributed generation programs may also result in additional costs to the utility that are difficult to recover through traditional ratemaking approaches.

In all of these conflict areas, there is presumably a utility approach that is preferred by the state (or by the state's alter ego, the regulatory commission) that does not necessarily correspond with the utility's best interests, or that of its stockholders. Thus, the regulators would prefer that the utility not over-invest in capital assets, not allow service quality to degrade, and not undermine the state's energy policies.

Recently, concerns have emerged in the industry about a squeeze on utility finances resulting from the increased costs of energy infrastructure, declining customer demand, and increased deployment of distributed generation. A report from Ceres framed the problem in terms of the following factors:

- slowing population and economic growth, which have reduced the rate of growth in electric consumption and customers' disposable income;
- increased customer interest in reducing energy usage and reducing the environmental impact of energy consumption;



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- public policies to increase energy efficiency and clean-energy production and to reduce environmental emissions;
  - increasing costs of new grid technologies, increasing utility capital budgets, and the need for higher electric rates;
  - programs that encourage clean technologies (e.g., net metering); and
  - retail electricity pricing based on energy consumption, even though a significant portion of utility costs are fixed.<sup>4</sup>

In addition to these factors, the economics of distributed energy resources (DER) continue to improve, due to technological advances, competition, government programs, and the advent of attractive customer financing options. The Ceres report expresses the concern that these factors

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“encourage a vicious cycle in which customers are motivated to self generate (such as by rooftop solar) to avoid increasing utility prices, thereby leaving the cost to fund the electric grid to an increasingly smaller group of customers” which, in turn, leads to higher rates and additional self generation.<sup>5</sup> Among the jurisdictions that are attempting to address these challenges through various means, including ratemaking reforms, are New York and the United Kingdom (highlighted in this report).

### III. RATE TREATMENT OF ENERGY EFFICIENCY

A customer energy efficiency program or other government policy implemented through an electric utility can have adverse financial consequences for a utility. There are three aspects of ratemaking relative to energy efficiency programs that should be considered: recovery of the costs the utility incurs in conducting the energy efficiency program, the reduction of fixed cost recovery from sales lost to energy efficiency, and some financial incentive to encourage the utility’s commitment to obtaining energy efficiency. Traditional ratemaking does not necessarily address any of these issues. To the extent that the energy efficiency program has a small budget and minimal impact on customers’ consumption, failing to address these issues is likely to have minimal impact on the utility. Any of the following factors, however, can result in the energy efficiency program having a material detrimental impact on the utility: a large and growing program budget, significant impact of the program on

<sup>4</sup> Peter Kind, *Pathway to a 21<sup>st</sup> Century Electric Utility*, p. 8 (Nov. 2015), at <https://www.ceres.org/resources/reports/pathway-to-a-21st-century-electric-utility/view>.

<sup>5</sup> *Ibid.*, p. 9.



customers' consumption, and economic stagnation that results in declining sales. In the recent past, energy efficiency programs have grown, and more state regulators are moving beyond traditional ratemaking approaches to address these issues in various ways.

With respect to cost recovery for energy efficiency programs, regulators may adopt a mechanism to track program costs and allow costs that exceed the level included in base rates to be recovered on a deferred basis or establish a special rate or rider to recover the energy efficiency costs. The lost revenue issue can be addressed with a mechanism that calculates revenue lost as a result of the program and allows the utility to recover this lost revenue in a subsequent period or through a decoupling mechanism. A shareholder incentive can take the form of a mechanism to share the net benefits created, rate basing of a portion of the energy efficiency expense so that it earns a return, or performance-based incentives.<sup>6</sup> Texas rules include a mechanism for recovering the costs of energy efficiency programs on a timely basis and an incentive mechanism, but they do not include decoupling or a mechanism that addresses lost revenue.<sup>7</sup>

Special rate programs for energy efficiency (along with other demand side management measures) became popular in the early 1990's. Demand side management incentives were incorporated in several regulatory mechanisms, including: revenue caps; revenue per-customer caps, in which average revenue per customer was capped; rate-of return incentives, which allowed higher earnings if energy conservation targets were achieved; lost revenue adjustment mechanisms, which delivered additional payments to utilities to offset revenue reductions caused by energy conservation initiatives; and shared savings mechanisms, which allowed utilities to share some of the benefits obtained through utilities' conservation activities.<sup>8</sup>


Lost revenue adjustment mechanisms or lost contributions to fixed costs are rate adjustment mechanisms that allow a utility to recover revenues that are reduced due to energy efficiency programs. The utility is compensated for the loss of revenue estimated to occur as a result of utility energy efficiency programs. A lost revenue adjustment mechanism does not eliminate a utility's motivation to increase sales, because additional revenues from increased sales, above that saved by the energy efficiency programs, can be retained by the utility. Lost revenue adjustment mechanisms are generally very complex to manage and typically face a number of implementation challenges. The timing of

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<sup>6</sup> Mike King et al, *Making a Business of Energy Efficiency: Sustainable Business Models for Utilities*, NERA Economic Consulting for Edison Electric Institute (August 2007): 13-14; Larry Blank and Doug Gegax, "Objectively Designing Shared Savings Incentive Mechanisms: An Opportunity Cost Model for Electric Utility Efficiency Programs," *Electricity Journal* (November, 2011): 31-40.

<sup>7</sup> 16 Texas Administrative Code § 25.181(f), (h). Subsection (f) establishes a procedure for setting the level of an energy efficiency rider on an annual basis, based on forecasted expenditures, with a reconciliation of expenses and revenues in the following year. Subsection (h) allows utilities to earn an incentive for exceeding their goals, based on a percentage of the net benefits of the programs.

<sup>8</sup> David Sappington, Johannes Pfeifenberger, Philip Hanser and Gregory Basheda, "The State of Performance-Based Regulation in the U.S. Electric Utility Industry," *Electricity Journal* (October 2001): 74.



energy efficiency program development, revenue adjustment determinations, and rate-making decisions are not always aligned, which becomes a major challenge to implementation.<sup>9</sup>

Decoupling is a regulatory mechanism that adjusts rates periodically to ensure that the utility recovers revenue for fixed costs that equals the amount of revenue authorized by the regulator for that purpose. Decoupling does not create an incentive for energy efficiency, but it removes a significant disincentive to invest in efficiency (and to oppose adoption, maintenance, or expansion of energy efficiency programs).

There are several options for revenue decoupling which have been employed by regulatory commissions. Fixed cost recovery, or lost revenue margin recovery, recovers only the revenue that contributes to fixed costs, and is calculated by multiplying the decline in sales times the proportion of the rate that covers fixed costs. A per-customer decoupling divides the allowed revenue requirement by the number of customers assumed in the rate case. Actual revenue per customer for the period is compared to the authorized revenue per customer to determine any under-collection (or over-collection) of revenue. Any under-collection is included in a rate adjustment for the next period. (Or the over-collection is returned to customers in the same manner.) Some mechanisms use the revenue authorized in the utility's last general rate case; others adjust that for specific cost changes or according to a formula. A decoupling mechanism does not affect the design of customer utility rates.<sup>10</sup>


Decoupling is much simpler to administer than a lost revenue adjustment, because it focuses on revenue sufficiency instead of attempting to directly attribute sales losses to energy efficiency programs. Decoupling mechanisms have been established in about one-third of the states, and these states have had the best results in encouraging and financing cost-effective energy efficiency measures. The move towards decoupling in the U.S. has been strongest in those states with well-defined commitments to pursuing energy efficiency. One observer argues that if the volume of sales is expected to rise significantly over time, then decoupling may work well, but if the volume of sales is expected to remain fairly constant, then a lost revenue adjustment, accounting for the direct loss of revenue due to efficiency, may be a better choice.<sup>11</sup> This is because slowing the rate of revenue growth reduces the benefit of regulatory lag, but doesn't necessarily result in a net deficit in coverage of fixed costs. When sales are flat or declining, the impact of energy efficiency on utility revenues will be to reduce revenues below the level needed to recover fixed costs. Another observer argues, based on financial modeling and experience in the natural gas industry, that decoupling is more acceptable to utilities that have

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<sup>9</sup> Maggie Molina and Marty Kushler, *Policies Matter: Creating a Foundation for an Energy-Efficient Utility of the Future*, American Council for an Energy-Efficient Economy (June 2015): 9; Annie Gilleo, Marty Kushler, Maggie Molina and Dan York, *Valuing Efficiency: A Review of Lost Revenue Adjustment Mechanisms*, ACEEE (June 2015).

<sup>10</sup> Pamela Morgan, *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs, and Observations*, Graceful Systems LLC (March 2013): 6; RAP, *Revenue Regulation and Decoupling: A Guide to Theory and Application* (June, 2011).

<sup>11</sup> Jim Lazar, *Performance-Based Regulation for EU Distribution System Operators*, Regulatory Assistance Project (May 2014): 5-8.



declining sales.<sup>12</sup> In 2014, 22 states had decoupling mechanisms in place for gas utilities and 17 states had policies for electric utilities.<sup>13</sup> These policies, along with energy efficiency targets for utilities, elevated the role of energy efficiency within utility companies and set the stage for a large increase in utility energy efficiency investments.<sup>14</sup>

### **Oregon Decoupling and Lost Revenue Mechanisms**

In 2009 the Public Utility Commission of Oregon (PUCO) adopted a decoupling mechanism and lost revenue mechanism for different classes of Portland General Electric Company (PGE) customers. These mechanisms were intended to remove the utility's disincentive to support energy efficiency programs. Oregon has a third party administrator for the utility-funded efficiency programs, the Energy Trust of Oregon, but the Commission concluded "that PGE does have the ability to influence customer usage, [and] we believe that a properly constructed decoupling mechanism would promote behavior by the Company that would be publicly beneficial."<sup>15</sup>

Prior to the adoption of decoupling, PGE's rates for residential and small commercial customers recovered a significant level of fixed costs through volumetric rates, and PGE argued that conservation and energy efficiency programs could reduce sales levels and lead to the under-recovery of its fixed costs. PUCO established different mechanisms for different customer classes, a Sales Normalization Adjustment (SNA) for residential and small commercial customers and a Lost Revenue Recovery for other customers with a demand of less than one megawatt. The SNA is a decoupling mechanism that compares actual weather-adjusted revenues related to fixed costs with the level of fixed costs per customer established in the most recent rate case, and the cumulative under-recovery is charged to customers or the over-recovery balance is refunded to customers on an annual basis.<sup>16</sup>

These mechanisms were initially approved for two years, and in 2013 the PUCO conducted an investigation of the decoupling mechanism, including a thorough review

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<sup>12</sup> Jay Zarnikau, *The Many Factors that Affect the Success of Regulatory Mechanisms Designed to Foster Investments in Energy Efficiency* (May 2010), at <http://link.springer.com/article/10.1007/s12053-011-9139-1>.

<sup>13</sup> National Resources Defense Council, *Gas and Electric Decoupling*, at <http://www.nrdc.org/energy/decoupling/> (last visited November 25, 2015).

<sup>14</sup> Pamela Morgan, *A Decade of Decoupling for US Energy Utilities: Rate Impacts, Designs, and Observations*, Graceful Systems LLC (March 2013); Dan York et al, *Making the Business Case for EE; Case Studies of Supportive Utility Regulation*, ACEEE (December 2013); Mark Lowry, Matthew Makos and Getchen Waschbusch, *Alternative Regulation for Emerging Utility Challenges: An Updated Survey*, Pacific Economics Group for EEI (January, 2013).

<sup>15</sup> *Portland General Electric Company Request for a General Rate Revision*, Docket No. UE 197, Order No. 09-020, p. 28 (Jan. 22, 2009).

<sup>16</sup> See Daniel G. Hansen et al., *An Evaluation of Portland General Electric's Decoupling Adjustment, Schedule 123*, (May 31, 2013), filed in *Portland General Electric Company Investigation into the Evaluation of Decoupling Mechanism*, Oregon Public Utility Commission Docket No. UE 215 (referred to as Christensen Report).



by an outside energy consultant. The consultant's report concluded that both of the mechanisms used in Oregon were effective in eliminating PGE's disincentive to support energy efficiency programs.<sup>17</sup> Ultimately, PUCO extended the mechanisms through 2016, with minor adjustments. The Commission noted that it had approved a decoupling mechanism designed to achieve a number of goals, including "removing the relationship between sales and profits, mitigating PGE's disincentives to promote energy efficiency, and improving PGE's ability to recover its fixed costs." It concluded that with minor changes the mechanisms would more closely align the outcomes with the goals.<sup>18</sup>

Addressing program cost recovery through an energy efficiency cost recovery mechanism and fixed cost recovery through decoupling, at the very least, makes utilities indifferent to investments in energy efficiency (*i.e.*, they do not view them as financial losses). However, these mechanisms may not be sufficient to encourage investment in efficiency as an earnings opportunity the same way that investment in new infrastructure does. Performance incentives for energy efficiency create an earnings opportunity by allowing energy efficiency activity to be a source of retained revenue, rather than just a pass-through of expenses. Performance incentives offer utilities a financial reward and motivation directly tied to achieving measurable successes in saving energy through energy efficiency programs. Currently, 25 states have implemented a performance incentive for at least one major utility, and two additional states have authorized policies that have not yet been implemented. This is a significant increase over the 18 states with policies in place as of 2011.<sup>19</sup>

There are a number of types of performance incentives in use by various state regulators, including performance targets, shared savings, cost capitalization and "Save-a-Watt," as proposed by Duke Energy. Under a performance target incentive mechanism, the utility receives a payment for achieving a specified performance goal, often a savings target. Shared benefits allow the utility to retain a pre-determined share of the net benefits from energy efficiency measures. Shared savings mechanisms in energy efficiency programs are relatively common in the U.S. Cost recovery is generally handled through a system benefit charge (tariff rider) with a periodic adjustment to ensure that all allowable costs are recovered from consumers. Experience in the U.S. has shown that the amount of shared savings incentive is typically a relatively small portion of the gross total savings.<sup>20</sup>

Capitalization programs tend to be similar to shared savings programs, except that instead of earning a bonus, the utility is able to capitalize expenses and/or receive an incentive in the form of a higher return on equity. Under cost capitalization, the utility has an opportunity to earn a rate of return


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<sup>17</sup> Christensen report, pp. 67-68.

<sup>18</sup> *Portland General Electric Company Request for a General Rate Revision*, Oregon Public Utility Commission Docket No. UE 262, Order No. 13-4590, pp. 10-11 (Dec. 9, 2013).

<sup>19</sup> Seth Nowak et al, *Beyond Carrots for Utilities; A National Review of Performance Incentives for Energy Efficiency*, ACEEE (May 2015): 20-24.

<sup>20</sup> Jim Lazar, *Performance-Based Regulation for EU Distribution System Operators*, Regulatory Assistance Project (May 2014): 5-9.



on energy efficiency-related investments.<sup>21</sup> Save-a-Watt is a capitalization mechanism that allows the utility to receive a return on a pre-determined portion of the total avoided investment in energy and capacity. Different types of incentives may be grouped or linked to specific performance goals (e.g., annual or lifetime energy savings, net benefits, or peak demand savings). Moreover, incentive mechanisms often include various design features, such as minimum performance thresholds, an earnings cap, and penalties for failure to achieve minimum acceptable performance.<sup>22</sup>

Successful energy efficiency/decoupling programs require monitoring and cost effectiveness criteria. Establishing incentives based on the level of procurement of energy efficiency would create an incentive to maximize the volume of savings, without regard to cost. Thus, program design is important, so that a more appropriate goal is established, such as net benefits. Other program features, such as adequate expenditure for measurement and verification, are also important. The regulator must anticipate the impact of the incentive and conduct balanced program reviews to identify egregious flaws, without compromising the commitment to maintaining a legitimate incentive (i.e., making above normal profits should not be considered a flaw but the incentive that makes the PBR work).

Decoupling and performance incentives for energy efficiency can mute utility opposition to efficiency programs, but a clear commitment by the state to energy efficiency is a key element of successful implementation of an energy efficiency program. The highest level of energy efficiency savings have been achieved by states that have an efficiency resource standard and performance incentives in place.<sup>23</sup> This may reflect a political consensus in favor of efficiency in those states, and the willingness to establish a “regulatory contract” with their utilities ensuring they will be held harmless if they enthusiastically participate in meeting the efficiency mandate.

#### **IV. PERFORMANCE BASED RATEMAKING**

Performance based ratemaking (PBR) is a tool that is being used to address some of these conflicts that utilities face. While the concept has a relatively long history in the U.S., there are very recent examples of regulators using PBR to influence utility behavior.

##### **New York, Reforming the Energy Vision and the Brooklyn Queens Demand Management Program**


In 2014, the Public Service Commission of New York initiated the Reforming the Energy Vision (REV) project, with the goal of adopting a new business model for

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<sup>21</sup> Mike King et al, *Making a Business of Energy Efficiency: Sustainable Business Models for Utilities*, NERA Economic Consulting for Edison Electric Institute (August 2007): 14-15.

<sup>22</sup> Peter Cappers et al, *Financial Analysis of Incentive Mechanisms to Promote Energy Efficiency: Case Study of a Prototypical Southwest Utility*, LBNL (March 2009): 8-13.

<sup>23</sup> Maggie Molina and Marty Kushler, *Policies Matter: Creating a Foundation for an Energy-Efficient Utility of the Future*, American Council for an Energy-Efficient Economy (June 2015): 13-15.



energy service providers that would involve: (1) using distributed energy resources (DER) as a primary tool in the planning and operation of electricity systems; (2) empowering customers to optimize their priorities as to reliability, cost, and sustainability; and (3) reforming the ratemaking process to modify the incentives and disincentives inherent in current ratemaking.<sup>24</sup> Shortly after the REV proceeding was initiated, Consolidated Edison Company filed an application to address significant load growth in Brooklyn and Queens through utility measures and an expanded program for customer investment in DER, including energy efficiency, demand response, energy storage, and distributed generation. The proposal included a monthly cost-recovery adjustment and targeted incentives for implementing the program and success in doing so cost-effectively.<sup>25</sup> The Commission adopted a cost-recovery mechanism and performance based rates to encourage the utility to engage its customers in DER, in order to serve customers more cost-effectively in a fast-developing area of Brooklyn and Queens.

There are some general themes underlying the various forms of PBR. The regulator must delegate some decision-making authority to the utility, and the PBR mechanism should create appropriate incentives and give the utility flexibility to respond to those incentives. Flexibility is important because it allows the utility to use its superior knowledge to find better ways to achieve goals; the strength of the incentives embedded in the policy determines how vigorously the utility will pursue those goals. In addition, the utility must be allowed to earn more than a normal profit. This is what provides the incentive for the utility to make choices that are consistent with government policy. The regulator must also commit to refraining from clawing back high earnings in subsequent regulatory reviews. An incentive is obviously not an incentive if it is clawed back.


### **Rate Freezes**

PBR regulations are a continuum, from simple modifications of rate of return regulation to comprehensive programs of performance targets with rewards and penalties attached to them. The simplest form of PBR is a rate freeze or moratorium, with rates initially established by traditional rate of return methods, and then frozen for a specified period. This is similar to the traditional regulatory lag between rate hearings, except that the utility loses the option of triggering a new hearing before the freeze expires. The rate freeze may thus incentivize the utility to maintain strict cost controls during the freeze period. The scope of the incentives in a rate freeze can be expanded if a bargain is struck

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<sup>24</sup> *Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, Case No. 14-M-0101, Order Instituting Proceeding, pp. 4-5 (April 25, 2014).

<sup>25</sup> *See Petition of Consolidated Edison Company of New York, Inc. for Approval of Brooklyn Queens Demand Management Program*, Case No. 14-E-0302, Order Establishing Brooklyn/Queens Demand Management Program, pp. 1-3, 8-9 (Dec. 12, 2014).



between the utility and the regulator that the utility will undertake specific actions during the rate freeze, such as improvements in the efficiency of its operations or carrying out some state-mandated program. For this approach to work, the utility must see a benefit in the rate freeze, that is, there must be an expectation that cost reductions or growth in consumption will result in additional net revenue for the utility during the freeze period.

### **Texas, CenterPoint Rate Freeze Plus Efficiency Commitment**

In September 2006 the Public Utility Commission of Texas (PUCT) approved a rate order for CenterPoint Energy that combined a rate freeze and an obligation on the part of CenterPoint to increase the spending for its energy efficiency program. The proceeding arose out of an application by the staff of the PUCT to reduce the rates of CenterPoint, a transmission and distribution utility operating in an area of Texas where retail competition had been initiated. A number of interested parties intervened in the proceeding, and they ultimately negotiated a settlement, based on the following points:

- CenterPoint's rates would be reduced by about \$58 million.
- CenterPoint would increase its expenditures for a residential and commercial energy efficiency program by \$10 million.
- The rates established by the PUCT under the settlement would remain in effect for at least 45 months.
- CenterPoint was relieved of the obligation under PUCT rules to file reports of its revenues and expenses for calendar years 2006-2008.

The Commission approved the settlement, and new rates were implemented in late 2006.<sup>26</sup> During the rate freeze, CenterPoint increased the level of spending for its residential and commercial energy efficiency program, as required by the Commission's order, and reported the results to the Commission. In accordance with the settlement, CenterPoint filed its next rate case in June 2010.


### **Earning Sharing Mechanisms**

Earning Sharing Mechanisms (ESM) are based on rate of return ratemaking, but permit the regulated utility to obtain a higher return than mandated in return for accepting the risk of lower returns. Under an ESM, the regulator establishes procedures for calculating the benefit of a prospective change in utility performance in specific areas of concern, rules for sharing the benefits between the utility and customers, and a mechanism for ensuring that the utility retains the appropriate share of the savings, based on the results of its actual performance and the benefits achieved. The utility's share of

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<sup>26</sup> *Petition by Commission Staff for Review of the Rates of CenterPoint Energy Houston Electric, LLC, Pursuant to PURA § 36.51, Order (Sep. 5, 2006).*





the benefits represents return above the normal rate of return or a commitment by the regulator not to seek to recapture the utility's share of the benefits in a rate proceeding. These rewards and penalties can be designed to work with energy efficiency or other policy goals, so that the utility keeps part of the benefit from increasing efficiency or meeting the policy goal.<sup>27</sup>

### **Performance Targets**

Performance targets provide rewards for meeting specified performance targets or penalties for failing to do so in conjunction with traditional rate of return regulation or other PBR mechanisms. This is a technique that is relatively simple in theory, in which the utility is rewarded for meeting a specific target. Regulators have used these mechanisms for many years to address traditional performance areas of concern such as reliability, safety, and energy efficiency. Performance metrics are most commonly applied to reliability and power quality measures. The targets modify traditional ratemaking by making regulatory goals explicit and applying incentives based on actual utility performance.


In assessing utility performance, metrics play a central role to determine how well a utility is performing in the areas of interest. Defining a metric requires specific data definitions, a formula to quantify each metric, data collection and analysis techniques, including identification of the entity responsible for collecting and reporting the data, and data verification procedures. In addition, performance targets must be established for each metric to determine when rewards or penalties are appropriate and the levels of the rewards and penalties. Where utilities are subject to economic and regulatory cost-cutting pressures, performance targets can encourage utilities to maintain or improve customer service, customer satisfaction, and performance in other relevant areas. For this reason, performance metrics are often employed in conjunction with other PBR mechanisms to provide an offsetting incentive to discourage reductions in investment in reliability and customer service. They can also provide explicit regulatory guidance in new and emerging areas of concern, such as grid modernization, or focus on specific policy goals, such as promoting clean energy resources. They can be applied incrementally, providing a flexible, relatively low-risk regulatory option.<sup>28</sup> There are some challenges involved in setting performance targets: the utility typically has superior knowledge of what is achievable in each performance area, and there is a risk that the utility's performance will suffer in areas that are not included in the performance targets.

Performance targets address the conflicting incentives that utilities face in two ways: (1) they make clear, through the establishment of performance metrics, which areas of the utility's performance are particularly important to the regulator, and (2) they allow a utility that performs well against the targets to earn above-normal returns. In theory, the rewards for meeting or exceeding the performance

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<sup>27</sup> London Economics, *Literature Review: Regulatory Economics and Performance-Base Ratemaking*, for the Department of Energy of Nova Scotia (2010): 73

<sup>28</sup> Melissa Whited, Tim Woolf and Alice Napoleon, *Utility Performance Incentive Mechanism: A Handbook For Regulators*, Synapse Energy Economics for the Western Interstate Energy Board, March 9, 2015.



metrics could offset the cost of improving service or revenue lost due to an energy efficiency program, and could, in addition, provide a return that is greater than the authorized return.

### **Price Caps**

Price cap regulation or PCR was proposed for British Telecom in the 1980s, and its use later spread to other public utilities in the U.K. and the U.S.<sup>29</sup> The Interstate Commerce Commission and the Federal Communications Commission were the first U.S. regulators to adopt a form of PCR in 1989, and state utility commissions began applying PCR to electric utility rates in the 1990's.<sup>30</sup> PCR was particularly attractive in connection with the regulation of telephone service, as competitive service providers emerged in the 1990's. One of the concerns that led to price regulation of railroads and utilities in the late 1800's was discriminatory rates, and most regulatory regimes include prohibitions against discrimination in prices and services. As competition emerged in the telephone industry, this prohibition was relaxed, and telephone utilities were allowed to offer prices lower than the cap, in order to compete on prices against their unregulated competitors.

Under price cap regulation, the regulator sets a price cap for each class of service and a formula that determines how rates can rise for utility services. Price caps provide incentives for improving the utility's productivity, and they can permit the utility to move to more efficient or more competitive prices, since the cap typically allows the utility to set rates at a level below the cap. The cap is automatically adjusted between regulatory hearings according to a formula. The standard formula for changes in the price cap allows the cap to rise by the rate of inflation (RPI) less an X factor, reflecting expected efficiency or productivity gains, or  $RPI - X$ . In the U.S., price caps were often expressed as  $RPI - X + Z$ , where the "Z" factor captured other exogenous factors that would affect the future cost of providing the service. Under price cap regulation, a general inflation factor or an industry-specific inflation measure could be used.<sup>31</sup>


The regulator can create incentives for the utility to invest in cost reductions and productivity improvements by including reasonable expectations of changes in input prices and feasible productivity gains in the variables. A utility that can do better in cutting costs or improving productivity than the expectations that are reflected in the variables is rewarded with higher profit, and one that does worse will have lower profit. In addition, if competition from other companies is a real threat for a sizeable part of the utility's business, competitive forces will support the rate cap regime, providing additional

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<sup>29</sup> Ingo Vogelsang, "Incentive Regulation and Competition in Public Utility Markets; a 20-Year Perspective," *Journal of Regulatory Economics* 22 (2002): 6.

<sup>30</sup> Mark Lowry and Lawrence Kaufmann, "Performance-Based Regulation of Utilities," *23 Energy Law Journal* 399, 416 (2002); Simon Cowan, "Price-cap Regulation," *Swedish Economic Policy Review* 9 (2002): 171-72.

<sup>31</sup> Mark Lowry and Lawrence Kaufmann, "Performance-Based Regulation of Utilities," *23 Energy Law Journal* 399, 411 (2002).



incentive to the utility to control costs and invest in equipment that will permit it to offer high-quality, cost-competitive service to customers.

Price caps alone would not address the conflicts arising from a requirement to comply with state policy goals, such as an end-use customer energy efficiency requirement. As in the case of a rate freeze, a bargain could be struck between the utility and the regulator that the utility would carry out the state-mandated program during the period that the cap is in effect, and the utility would be allowed to retain any revenue associated with more efficient prices, lower costs, and growth in consumption during the cap period.

### **The Recent UK Experience**

One approach to achieving policy goals in a price cap environment is to couple the price cap with performance targets. The regulator for the transmission and distribution utilities in the U.K. has recently embarked on a major change in how rates are set. The U.K. has used an RPI - X approach, but is now implementing what it calls RIIO, or Revenue = Incentives + Innovation + Outputs. The objectives of the new approach include (a) shifting the focus from cost control to delivery of outputs through the use of performance incentives, (b) increasing the focus on innovation through financial incentives and an innovative projects competition, and (c) increasing the emphasis on competition where possible. The new approach includes rewards for utilities that exceed certain performance metrics.<sup>32</sup> The RIIO approach involves a level of complexity that most U.S. regulators would probably avoid, but the heart of this approach is straightforward, coupling the expected efficiency benefits from a price cap with the expected public policy benefits from performance targets.


### ***Revenue Caps, Revenue Regulation, or Decoupling***

Revenue caps or revenue regulation “decouples” the allowed revenue collected by the regulated utility from the sales volume. The total revenue collected remains fixed or is adjusted according to a formula, while rates will change based on the actual level of sales realized over the relevant time period. The formula might be a fixed annual authorized revenue per customer (RPC decoupling), or a formula that allows the revenue to change with a combination of factors, including inflation, changes in investment, and changes in expenses between major rate reviews (attrition decoupling).<sup>33</sup> Revenue regulation is administratively easy to implement, it creates incentives to reduce costs, and it removes the disincentive to implement customer energy efficiency programs, because the lost revenue is restored through the adjustment mechanism.

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<sup>32</sup> *Utility Performance Incentive Mechanisms: A Regulator's Handbook*, Synapse Energy Economics, Inc., p. 70.

<sup>33</sup> Jim Lazar, *Performance-Based Regulation for EU Distribution System Operators*, Regulatory Assistance Project (May 2014): 3.



A utility under revenue regulation with a fixed, authorized revenue per customer may face challenges if inflation significantly reduces the purchasing power of its authorized revenue or if it loses customers through a contracting economy in its service area. Because a large part of a utility's cost structure consists of fixed costs, fewer customers would mean less revenue to cover the fixed costs.

### **Idaho Fixed Cost Adjustment**

The Idaho Public Utility Commission (IPUC) initiated an investigation of alternative ratemaking schemes in 2004, with the objective of changing Idaho Power Company's incentives with respect to an energy efficiency program, specifically, addressing the reduction in customers' consumption and the utility's revenue as a consequence of the program. While the Fixed Cost Adjustment (FCA) was in effect, the utility would recover the same fixed costs per customer, even if energy efficiency programs reduced consumption. Thus, the FCA program would remove the disincentive to conduct energy efficiency programs. The Commission initiated a pilot project to decouple revenues and rates in 2006.<sup>34</sup> In adopting the pilot program, the IPUC emphasized the connection between changing the utility's incentives and the Commission's efficiency goals:

*Making the Company indifferent to reduced energy consumption and demand is but one half of the quid pro quo agreed to by the stipulating parties. In return for the FCA, the Company is expected to demonstrate an enhanced commitment to energy efficiency and DSM.<sup>35</sup>*

In 2012 the IPUC continued the FCA mechanism in effect, without changes.<sup>36</sup>

### **Other Challenges for Energy Efficiency**


In the context of the utilities' financial squeeze resulting from increased costs and loss of sales to distributed energy resources (DER), some utilities have proposed reforming the rate structure to better reflect the cost structure, *i.e.*, by recovering significantly more of their costs through fixed charges. Because utility fixed costs are recovered mostly through volumetric rates, the utility's loss of sales to customers with DER must be made up through higher rates charged to all customers. Increasing the proportion of rates recovered through fixed charges would address this issue to some degree, because most customers with DER remain customers of the utility, but at a lower volume of sales. Efforts to increase fixed charges have been mostly unsuccessful, however, because they have a significant impact on customer bills and undermine state policies to encourage clean distributed

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<sup>34</sup> *Investigation of Financial Disincentives to Investment in Energy Efficiency by Idaho Power Company, Case No. IPC-E-04-15, Order No. 30267, p. 1-2 (Mar. 12, 2007).*

<sup>35</sup> *Ibid.*, pp. 13-14.

<sup>36</sup> *Application of Idaho Power Company for Authority to Convert Schedule 54—Fixed Cost Adjustment—From a Pilot Schedule to an Ongoing Permanent Schedule, Case No. IPC-E-11-19, Order No. 32731, p. 4 (Jan. 31, 2013).*



resources.<sup>37</sup> Shifting costs from volumetric to fixed rates reduces customers' incentive to increase their energy efficiency. The availability of clean DER that is affordable for many customers and the prevalence of support mechanisms for clean DER are likely to make this issue of a financial squeeze an important one for many utilities, and make the search for a solution to this issue a significant consideration in utility rate-setting.

## VI. CONCLUSION

Utility management has a fiduciary obligation to protect the interests of utility shareholders and to seek maximum returns on their behalf. Thus, management would be expected to be concerned about cost recovery and the potential for lost earnings associated with customer energy efficiency programs. Moreover, regulators have a legal obligation to afford a utility the opportunity to recover its reasonable costs and a reasonable rate of return on investment. In an environment of large or growing energy efficiency programs, part of the cost that should be addressed is the lost revenue that results from a successful energy efficiency program. Regulators across the country have begun to address the issue of full cost recovery. However, utility management may still have legitimate concerns beyond recovery of program costs and lost revenue. Will utilities fully embrace a large state-mandated program that requires significant expertise and thoughtful management but does not contribute to profitability? It may not be sufficient to merely protect the utility from lost revenues due to energy efficiency. Rather, incentive mechanisms that make increased energy efficiency a "profit center" for the utility may also be required. The optimal regulatory strategy for energy efficiency may include some combination of a clear state policy goal, and procedures for timely recovery of energy efficiency program costs, reducing the lost revenue risk through decoupling, and providing opportunities for increased earnings from effective management of energy efficiency programs that create net benefits for society.

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<sup>37</sup> Peter Kind, *Pathway to a 21<sup>st</sup> Century Electric Utility*, p. 30.



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