Seeking Consistency in Performance Incentives for Utility Energy Efficiency Programs

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ABSTRACT

Regulators and legislators in many jurisdictions are requiring or investigating a variety of shareholder incentive mechanisms to overcome the inherent disincentives to utility investment in energy efficiency and demand side management as compared to supply-side investments. Performance incentive mechanisms are one of many tools available.

The authors briefly examine the need and justification for performance incentives, the historical utility financial structures with regard to energy efficiency and challenges to this model created by policy initiatives, propose a set of metrics for shareholder incentives and set of criteria for comparability, present a sample of approved shareholder incentive mechanisms in tabular format, and suggest additional research efforts.

The Need for Shareholder Incentives for Energy Efficiency Programs

Utility regulators have approved a large number of shareholder incentive mechanisms to promote utility energy efficiency programs with the ultimate goal of achieving a variety of public purposes, such as emissions reductions, energy security, and cost-control. However, in contrast to the standard methodology and benchmarks available to regulators for determining the allowed return on equity (ROE) on utility investments in supply-side resources, utility regulators have employed a wide variety of practices and standards when approving shareholder incentives for energy efficiency programs. This report explores initial practices for shareholder incentives.

Although it is less common today than it once was, utility compensation for energy efficiency programs is sometimes limited to simple recovery of its actual program expenditures, excluding any type of return. Yet as increasing amounts are spent on energy efficiency, the increasing emphasis on evaluation, monitoring and verification (EMV) provides a basic link to the energy reductions actually achieved, i.e., a demonstration of the actual results or performance. More frequently, regulators are also making an explicit link between the level of actual energy efficiency reductions and the utility's revenue requirement, and providing a performance-based ratemaking structure that includes a financial incentive that benefits utility shareholders.

Shareholder incentives may be necessary because utility activities that lead to reductions in energy use or increased self-generation will typically reduce electricity sales, thereby reducing earnings on existing investments in supply-side resources and reducing opportunities to earn on investments in new supply-side resources. For investor-owned utilities, these activities tend to reduce profitability, except perhaps for utilities operating under full revenue decoupling (RAP 2008). For public utilities, the lack of shareholder equity requirements mitigates the economic problem, but utility managers may be concerned about budget uncertainty and bond debt requirements (APPA 2009). Resolving the problem of reduced profitability for investor-owned utilities is a significant barrier to energy efficiency, "Some consumer interests challenge whether there is a reasonable and objective way to set shareholder incentives that are sufficient for their purpose but not excessive" (NAPEE 2006; NAPEE 2007).

Historical Treatment of Energy Efficiency Revenue Requirements

The revenue requirement impacts of a new or expanded utility energy efficiency program are often structured around three components, with an appropriate level set to reflect cost-of-service ratemaking principles.

- Program costs are recovered either as expenses, or as amortized (capitalized) regulatory assets including a financing requirement.
- A shareholder incentive may be included, creating an opportunity for shareholder earnings.
- A rate structure or adjustment may be established to secure the company from erosion of its existing revenue requirement for costs associated with its rate base (power plants, distribution systems, and other fixed costs). Utility regulators have addressed revenue erosion using a revenue decoupled rate structure or a lost revenue adjustment mechanism (RAP 2007).

A proper integration of these three components will consider the utility's attributes, and should place demand-side activities on an equal footing with supply-side investments. Since establishing these revenue requirements and rate structures is the responsibility of utility regulators, public policy (rather than business management) ultimately sets the balance between shareholder and public interest in funding energy efficiency programs. [1]

For vertically-integrated, regulated utility (owning substantial generation assets as well as distribution systems) revenue decoupling or a lost revenue adjustment mechanism may well be the largest change to the rate structure measured in dollars. However, because underlying revenue requirement remains unchanged (in principle), this component is better described as a shift in rate structure than an increase in revenue requirements. In contrast, if the utility regulator authorizes a shareholder incentive, this component will represent a new, distinct revenue requirement associated with energy efficiency.

For supply-side investments, regulators provide shareholders a reasonable opportunity to earn an authorized ROE using well-established methods and benchmarks for setting a utility's revenue requirements at a level that will result in "just and reasonable rates".[2] Utility regulators consider utility-specific factors when applying three key ratemaking principles. These are that the authorized ROE should be sufficient to: 1) maintain the utility's financial integrity; 2) attract necessary capital; and, 3) provide a return on equity commensurate with the returns being earned by other companies facing similar risk (Phillips 1993).

In contrast, there is no generally accepted method or benchmark for determining the level of shareholder earnings from energy efficiency programs that is just and reasonable. In layman's terms – how do we know whether a particular incentive is too low or too high? The absence of such a standard methodology or set of benchmarks is due to several factors.

[1] In the context of this paper, "energy efficiency" and "demand-side management (DSM)" are equivalent and include the full range of efficiency and demand response opportunities. Renewable and alternative energy resources may have additional characteristics that are not treated here.

[2] This, or comparable language, is the standard across the regulatory community.

- Most utilities have not treated energy efficiency as their top priority. Annual expenditures on energy efficiency have been relatively small and stable.
- The resource plans used by many utilities account for energy efficiency in load forecasting, rather than during the selection of a preferred alternative (Barbose 2007).
- Utility regulators have often used annual expense riders to provide for direct cost recovery of demand-side management expenditures as expenses. Regulators have established system benefits charges in some states, or expense recovery riders similar to (or even included in) fuel cost riders. Utilities typically do not have an earnings opportunity for this type of revenue stream.
- It is straightforward to establish that expense riders or system benefits charges are consistent with cost-of-service ratemaking principles. In contrast, it can be complex to demonstrate what level of "cost" is required address revenue erosion or provide a reasonable shareholder incentive for energy efficiency services.

As a result, there has been a lack of clarity on what, if any, level of shareholder incentive would be just and reasonable.

It appears that many utilities have implemented modest levels of energy efficiency programs without a shareholder incentive, revenue decoupling, or a lost revenue adjustment mechanism, at least over the past two decades. In the 1980s, a variety of lost revenue adjustment mechanisms were authorized but almost all were dropped, for example due to deregulation.

Challenges to the Historical Cost-Recovery Model

Looking forward, the US Department of Energy (DOE) "is seeking a major increase in energy efficiency at the state level" (US DOE 2010). DOE wants to "help states with little or no savings from energy efficiency programs to become leaders in reducing electricity consumption by providing [public utility commissions] the assistance to develop an energy efficiency goal … of at least 1 percent."

Whether motivated by federal or state policy action, many utilities will be asked to implement much more aggressive energy efficiency programs. In the face of increased savings targets, utilities may reasonably request changes to their rate structures to mitigate revenue erosion and to provide them an opportunity to achieve earnings commensurate with the challenges and risk inherent in managing energy efficiency programs. Suggested changes in rate structures inevitably, and understandably, create controversy by upsetting the existing balance of interests in the existing rate structure.

One aspect of the controversy is the question, "Which is better for consumers: a utility sector that relies on the power of regulation to get public interest results, or a utility sector that is designed with incentives that will tend to produce public interest results, including more cost-effective energy efficiency?" (NAPEE 2007).

Iowa is one state that has used the "power of regulation" to achieve relatively high levels of energy efficiency (IUB 2009). For many years, Iowa utilities have not had any explicit mechanism to address revenue erosion or provide a shareholder incentive to its investor-owned utilities. Iowa's experience may reflect a perspective that energy efficiency is simply one of the activities a utility conducts to satisfy its obligation to provide reliable service at reasonable rates.

An incentive-based approach to energy efficiency is another alternative. As described by the National Action Plan for Energy Efficiency:

> Under traditional regulation, investor-owned utilities earn returns on capital invested in generation, transmission, and distribution. Unless given the opportunity to profit from the energy efficiency investment that is intended to substitute for this capital investment, there is a clear financial incentive to prefer investment in supply-side assets, since these investments contribute to enhanced shareholder value. Providing financial incentives to a utility if it performs well in delivering energy efficiency can change that business model by making efficiency profitable rather than merely a break-even activity. (NAPEE 2007)

States that resolve to provide a shareholder incentive, in the absence of generally accepted practices and standards for establishing "just and reasonable" levels, have a significant analytic problem. How do regulators, and their ultimate constituency, the ratepayers know if the shareholder incentive levels are about right … or too generous?

Research at the Lawrence Berkeley National Laboratory suggests that a positive financial structure is needed for an investor-owned utility to invest in energy efficiency (Cappers 2009). As illustrated in Figure ES-4 of the LBNL report, a utility implementing energy efficiency program without a shareholder incentive mechanism may experience a reduction in both absolute earnings and ROE. This report illustrates the classic disincentive to energy efficiency facing a vertically integrated utility. In short, the model results demonstrate how important a fair and properly structured utility incentive structure is to energy efficiency.

The LBNL report also illustrates that energy efficiency programs may reduce total ratepayer bills in the long term under several model revenue recovery models and levels of investment in energy efficiency programs. Consistent with other studies and historical findings, the reduced revenue requirement occurs even though the model indicates small retail rate increases (see Figure 20 of the report). The most aggressive levels of energy efficiency studied also save customers the most money.

All of the financial structures studied by LBNL offer an enhanced ROE at any level of energy efficiency performance. As illustrated in Figure ES-7 of the report, a combination of a shareholder incentive mechanism with decoupling or lost revenue adjustment mechanism puts energy efficiency on the positive side of the balance sheet compared to business-as-usual.

The LBNL report offers a comprehensive framework for evaluating the effect of addressing the entire impact of energy efficiency programs on utility ROE. Due to its complexity, it may not be practical for all utility regulators to apply the methods used by LBNL when considering utility energy efficiency incentive proposals. At a minimum, the LBNL report helps demonstrate the shortcomings of considering energy efficiency as a special, even exotic, activity outside the normal utility ratemaking and planning process. Instead, the LBNL report shows that modeling the impact of energy efficiency on the cost of service, revenue requirements and rate of return of the utility as a whole provides more useful information.

Nevertheless, as noted in closing, the LBNL report does not answer the question, "*How much is necessary to motivate the utility to increase energy efficiency programs substantially, or to acquire all available cost-effective energy efficiency?*" Our research found that surprisingly few states have considered this question. One exception is Washington: A recent third-party evaluation for the utility commission staff found that the incentive mechanism to be a "significant driver" behind an 11% increase in energy savings, but that the incentives have not provided "full recovery of lost margin" (BRCS 2009). A fair and equitable incentive may be more, or less, than is required to motivate utility management in the context of other financial and regulatory considerations.

Considering the scope, complexity and real-world limitations faced by utility regulators, a simple method of describing a proposed shareholder incentive, how it may affect utility ROE, and what results have actually been achieved by utilities under a given incentive framework over several years will be useful.

Metrics of Shareholder Incentives for Energy Efficiency

To help understand what a "just and reasonable" shareholder incentive may be, we reviewed shareholder incentive mechanisms approved by, or awards authorized by, utility commissions. In comparing the incentives, we focused on two metrics: *return on program costs* and return on net savings (often called *shared savings*).

We chose the *return on program costs* and *shared savings* metrics because:

- The metrics are themselves commonly used to calculate to shareholder incentives;
- The metrics can be roughly calculated using a limited number of inputs which are likely to be readily available and not likely to be matters of contention among stakeholders;
- Either one or both metrics, with a few additional assumptions, can be evaluated in a manner which may be viewed as consistent with traditional ROE analysis; and
- The metrics are analogous to concepts in common usage in our society and may be comprehensible to a wide range of stakeholders (even if this paper is not!).

These metrics are not straightforward to apply because utility regulators have established such a wide variety of shareholder incentives, sometimes even within a state. Our metrics highlight that variation, provide some consistency in evaluating the different decisions made by utility regulators, and suggest the ranges within which utility regulators have answered the question, "What shareholder incentive for energy efficiency is just and reasonable?"

Neither metric is directly comparable to a ROE. Although there are well-established formulae for calculating an allowed rate of return on supply-side investments, there are differences of opinion as to the input assumptions that should be used in those calculations. The literature on regulation indicates that establishing a fair rate of return involves the exercise of judgment and tends to identify a range of reasonableness rather than a single value. For example, one of the criteria for establishing a fair ROE is that it provides utility shareholders a return on equity commensurate with the returns being earned by other companies facing similar risk (Phillips 1993).

Considering that there is relatively little opportunity to place actual energy efficiency assets into rate base, the concept of "return on equity" cannot be directly applied to energy efficiency because of the obvious question, "Equity in what?" Converting an expense into a regulatory asset is a reasonable concept, but utility regulators can and have reduced or eliminated regulatory assets in the past, increasing the risk associated with their "ownership."

Without the opportunity to directly apply the ROE concept to energy efficiency, utility regulators have adopted different practices and standards. One effect of this variation is that the basic data needed to calculate the metrics we suggest are not always available.

A more important effect is that the lack of consistency across jurisdictions can amplify the level of confusion in utility regulatory deliberations. Utility regulators may be reluctant to approve fair shareholder incentives without clear evaluation criteria for meeting traditional cost-of-service ratemaking criteria, overcoming the utility disincentive toward energy efficiency activities, and even providing a performance incentive.[3] Or they may mistakenly approve an excessive shareholder incentive.

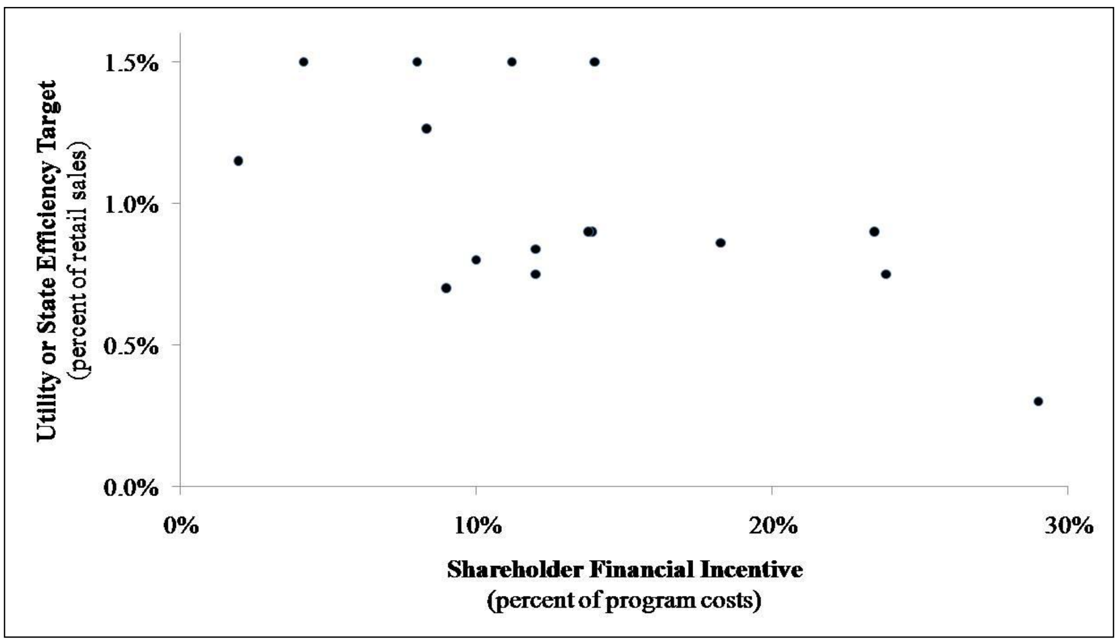
As for supply-side considerations, regulators will want to ensure that the shareholder incentives that they offer are commensurate with the incentives offered to other utilities in facing similar risk. Access to the type of data we have collected may significantly assist utility regulators make sound decisions.

Criteria for Identifying Comparable Utilities

Our survey evaluated performance incentive mechanisms with consideration of the historic, market and regulatory context affecting the utility.

Historical considerations. For example, utilities that have historically achieved little-to-no energy efficiency will find that many of the "easy" opportunities are available, while an otherwise-comparable utility with a history of leadership will have the advantages of experience and established market relationships. Overall, we note a tendency to offer greater performance incentives to utilities with smaller energy efficiency goals (see Figure 1).

Figure 1. Efficiency Savings Target Compared to Utility Financial Incentive



Source: Data from Table 1

[3] As noted above "maintain the utility's financial integrity, attract necessary capital, and provide a return on equity commensurate with the returns being earned by other companies facing similar risk."

Market structure. Distribution-only and vertically-integrated electric utilities experience the impacts of reductions in retail electric use differently. The potential impact on profits from energy efficiency is worse for distribution-only, investor-owned utilities than they are for vertically-integrated utilities (RAP 2001). However, large debts associated with power plants can make vertically-integrated utilities quite cautious about future lost revenues. In addition to facing different risks, the market structure of a utility also affects its opportunities to mitigate lost revenues. A vertically-integrated utility may have opportunities available to offset lost retail revenues with revenues from off-system sales; a distribution-only utility's flexibility will depend on the nature of its power supply contracts and the degree of flexibility allowed by its wholesale market opportunities. Thus, we distinguish between *vertically-integrated electric utilities, distribution-only utilities*, and *government or not-for-profit utilities*, although we do not evaluate any utilities in the third category in this paper. This factor could be broadened to consider the degree of self-generation that vertically-integrated utilities operate, the market penetration of natural gas utilities, and the degree to which the natural gas and electric utilities are owned by the same corporation. Overall, shareholder incentives and other features appear to be similar for the two categories of utilities (see Table 1).

Market trends. Energy resource needs are clearly relevant to management interest in energy efficiency. A high-growth utility may see an opportunity to meet demand with energy efficiency, or may view energy efficiency as an unwelcome mandate that interferes with capital expansion plans anticipated by shareholders. Changes in generation fuel mix, whether driven by market forces or policy direction, will also be a factor. An aging fleet of power plants will be relevant to the utility's perception of shareholder value. Our analysis did not consider market trends.

Policy framework. States policies vary, and may establish an energy efficiency resource standard (explicit energy savings target), a specific energy efficiency policy (e.g., "all cost-effective"), a general energy policy (e.g., least-cost resource planning), or a mandated system benefit charge that funds energy efficiency. We do not consider third-party administrators, such as those in Oregon, Vermont, and Maine, in this paper. We did not identify any state that has authorized a substantial financial incentive mechanism absent an explicit energy efficiency target, with the exception of South Carolina (see Table 1). South Carolina is a special case, in that two large utilities which also serve North Carolina sought approval for nearly-identical plans in South Carolina. However, this has had an indirect impact on a third utility that serves only South Carolina: a shareholder incentive is included in a recent settlement agreement for SCE&G.

Regulatory ratemaking practices. Application of the metrics in our survey should also consider regulatory ratemaking practices. These practices are relevant because they affect the data directly (similar terms may have different meanings) and because the overall regulatory context affects their financial impact. Some of the following features are considered in our survey (see Table 1).

- Funding source and mechanism for program cost recovery; most states operate with a system benefit charge or tariff rider, with annual true up
- Mechanism to mitigate revenue erosion, such as decoupling, a lost revenue adjustment mechanism, or frequent rate cases; states without such mechanisms tend to have lower financial incentives (perhaps contrary to intuition)
- Level of ROE (for extensive consideration of the implications, see Kihm 2009)

- When regulatory assets are established by capitalizing energy efficiency expenditures:
  - depreciation schedule
  - level of risk to shareholder investments due to energy efficiency
  - consideration of energy efficiency performance in establishing the overall ROE
  - use of a "ROE adder" for capitalized energy efficiency expenditures
- Design, frequency and role of integrated resource planning
- Link between energy efficiency savings and shareholder incentive (only two states have authorized financial incentives that are uniform across all levels of performance)

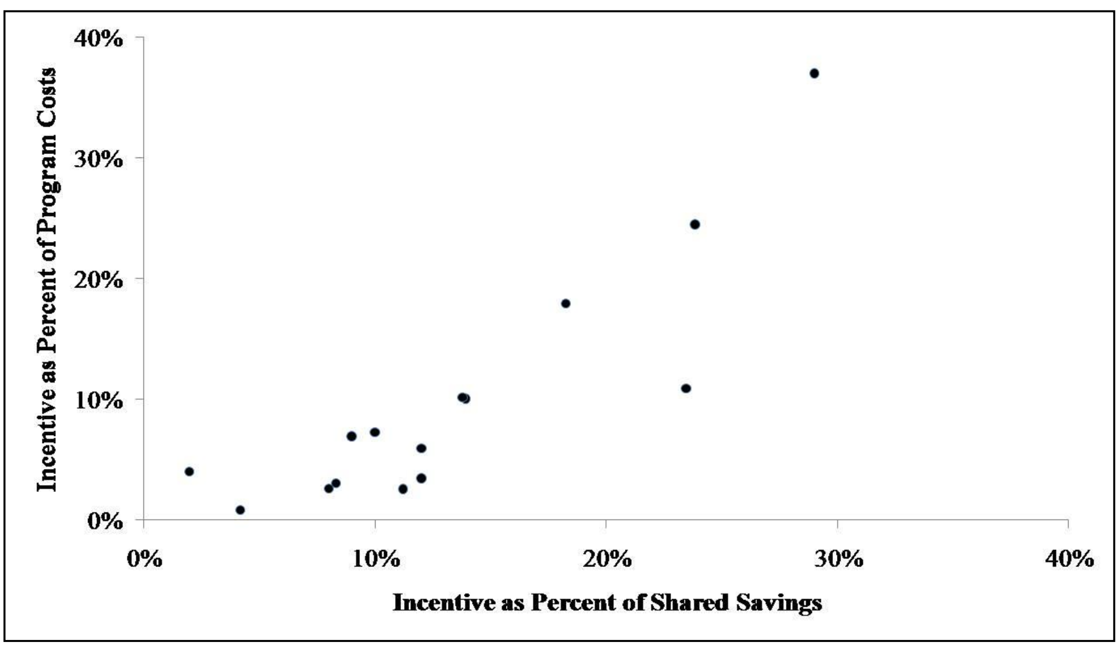
Balancing the factors listed above, and others that may also be identified, is clearly a complex and ultimately subjective task; while data cannot provide the answer, the use of appropriate metrics can eliminate flawed alternatives.

Survey of Shareholder Incentives by State

The summary presented in Table 1 compares the financial incentives of eighteen utilities using the *return on program costs* and *shared savings* metrics described above. As illustrated in Figure 2, the relationship between these metrics is close, but not exact.

Even with the same shareholder incentive mechanism and regulatory framework, the incentives may "score" differently under these metrics. For example, California operates under a "shared savings" mechanism, but both the net benefits ("shared savings") and cost basis are different than the standard utility cost test based metrics used in this report. Among the three California utilities, Southern California Edison's forecast program costs were substantially lower than those of the other two utilities, resulting in what appears to be a significantly higher incentive relative to program costs (see Table 1).

Figure 2. Efficiency Savings Target Compared to Utility Financial Incentive



Source: Data from Table 1

The varying approaches to cost and benefit considerations across the states create some practical difficulties for our survey as well. For example, Arizona's performance incentive is based on a "societal" measure of benefits. Available documents did not provide detail for calculating those benefits, and thus our survey is unable to estimate the shareholder incentive as a percentage of our *shared savings* metric.

Another complication in our survey relates to consideration of states with cost capitalization for all or part of their energy efficiency program. South Carolina allows Progress Energy to capitalize all its energy efficiency costs for ten years, and Michigan allows its utilities to capitalize certain types of energy efficiency costs for five years. This survey consider the associated return on equity as a component of the shareholder incentive, reflecting the perspective that the regulatory justification for shareholder incentive mechanisms is the recognition that the cost of shareholder equity is a cost-of-service, appropriately recognized in the revenue requirement associated with energy efficiency.

Data Evaluation Method

Percentage of program costs metric. We calculated this metric in terms of the program cost according to the program administrator cost test (often known as the utility cost test, or UCT), considering only costs to the energy efficiency program administrator. We advise against using total resource cost test (TRC) measure of costs. The TRC costs include participant costs, which could raise complex issues: since participants receive non-energy benefits from some efficiency measures (e.g., greater comfort), consideration of the participants' incremental costs would also require consideration of participant benefits.

Shared savings metric. Similarly, we also suggest that the shared savings metric adopt the UCT cost and benefit definitions. A strong case can be made for use of the TRC definitions, which better reflects the overall value to society of energy efficiency programs. However, due to the need for additional inputs, potential for disagreement between stakeholders on the value of these inputs, and a lack of consistency across reporting organizations, we suggest that UCT definitions are a more practical metric for comparison across regulatory jurisdictions. If consistent data becomes more widely available, a TRC-based shared savings metric would become more feasible.

Necessary Inputs. We evaluated both metrics using "pre-tax" values based on the preponderant convention. For a specific utility, the following inputs are necessary to calculate both metrics.

- Total utility program costs
- Total utility benefits (avoided costs)
- Savings (energy and capacity if appropriate)
- Utility incentive

Determining these basic inputs is not always straightforward but these factors are commonly determined during the regulatory process and thus theoretically available and reliable. We hope that this paper at least generates discussion about the value of codifying and standardizing reporting across jurisdictions to support increased data-based decision making in the future.

Table 1. Approved Shareholder Incentives

State	Entity (Year Approved)	Regulatory Framework			Shareholder Incentive Features					
		Explicit Efficiency Target	Direct Cost Recovery	Earnings Erosion Mechanism	Utility Specific Target	Pre-Tax Incentive		Threshold or Scaling	Cap	
						Program Costs	Shared Savings		Basis	Level
		Distribution-Only Utilities								
CT	Connecticut utilities (2007)	Yes	SBC	Decoupling	1.50%	4.2%	0.8%	Yes	PC-PT	8%
NH	PSNH (2000)	Yes	SBC	None	1.50%	8.0%	2.6%	Yes	PC-PT	12%
NY	New York utilities (2008)	Yes	SBC	Decoupling	0.70%	9.0%	6.9%	No	Fixed	3.9 ¢/kWh
OH	Duke Energy Ohio (2008)	Yes	TR	LRAM	0.80%	10.0%	7.2%	Yes	PC-AT	15%
CA	PG&E (2007)	Yes	SBC / TR	Decoupling	0.90%	13.9%	10.0%	Yes	Fixed	$180 m
CA	SDG&E (2007)	Yes	SBC / TR	Decoupling	0.90%	13.8%	10.1%	Yes	Fixed	$50 m
CA	SCE (2007)	Yes	SBC / TR	Decoupling	0.90%	23.5%	10.9%	Yes	Fixed	$200 m
		Vertically Integrated Utilities								
WA	PSE (2007)	Yes	TR	None	1.26%	8.3%	3.0%	Yes	No	n.a.
CO	Xcel - PS CO (2008)	Yes	TR	$2 m offset	1.15%	2.0%	4.0%	Yes	PC-PT	20%
MN	Xcel – NSP (2000)	Yes	TR	None	1.50%	11.2%	2.5%	Yes	PC-PT	30%
MI	Consumers Energy (2009)	Yes	TR / CC	Decoupling	0.84%	12.0%	3.4%	Yes	SS-PT	25%
MI	DTE (2009)	Yes	TR / CC	Decoupling	0.75%	12.0%	5.9%	Yes	SS-PT	25%
AZ	APS (2010)	Yes	BR	Deferred	1.50%	14.0%	not avail.	Yes	PC-PT	14%
IN	Duke Energy IN (2010)	Yes	TR	LRAM	0.86%	18.3%	17.9%	Yes	PC-AT	15%
NC	Duke Energy Cs (2010)	Option	TR	LRAM	0.75%	23.8%	24.5%	Yes	PC-AT	15%
SC	Duke Energy Cs (2010)	No	TR	LRAM	0.75%	23.8%	24.5%	Yes	PC-AT	15%
NC	Progress Energy Cs (2009)	Option	TR / CC	LRAM	0.30%	29.0%	37.0%	No	SS-AT	8% / 13%
SC	Progress Energy Cs (2009)	No	TR / CC	LRAM	0.30%	29.0%	37.0%	No	SS-AT	8% / 13%

Source: Analysis of commission orders, and related testimony and reports by authors. Workbook, including sources, available from the authors. Further details regarding state energy efficiency regulatory frameworks are available from the State Energy Efficiency Database maintained by ACEEE on its website and the Edison Foundation Institute for Electric Efficiency.

Table 2. Reference for Abbreviations in Table 1

Column Title	Indicator	Definition
Explicit Efficiency Target	Yes	Legislative energy efficiency resource standard or directive to utility commission to establish such a standard
	Option	Compliance option in a state renewable energy standard
	No	Energy efficiency programs authorized under a non-directive process
Direct Cost Recovery	SBC	System Benefit Charge
	BR	Base Rate Recovery
	TR	Tariff Rider
	CC	Cost Capitalization
Earnings Erosion Mechanism	Decoupled	Full or partial revenue decoupling applying to general rates
	Deferred	Regulator deferred action to a future rate case
	Offset	Fixed amount of compensation to offset lost revenues
	LRAM	Lost revenue adjustment mechanism
Utility Goal	% Savings	Highest energy savings target or forecast associated with the shareholder incentive mechanism; intended to be a general indicator of program scale
Pre-tax Incentive	Program Costs	Shareholder incentive expressed as a percentage of total program costs
	Shared Savings	Shareholder incentive expressed as a percentage of net benefits
Scaled	Yes/No	The presence of a tiered or scaled incentive structure linked to performance, however measured, including minimum threshold for incentive eligibility
Cap	Basis and Level	Many states have a secondary cap to the performance-based shareholder incentive. If so, this secondary cap is described here. If not, then the basis and maximum level for the shareholder incentive mechanism is described here. The basis may be a percentage of program costs (PC), shared savings (SS), or a fixed amount, and may be calculated on a pre-tax (PT) or after-tax (AT) basis.

Source: Authors development of survey structure

Our survey indicates that regulators have approved shareholder incentives with annual impacts between 2% and 29% of program costs or between 1% and 37% of net benefits. For the purposes of decision support, this appears to be an unwieldy range of incentive levels. Further analyses with consistent data sets should be able to identify a much narrower range of incentive levels that would be adequate to motivate utilities to meet societal and regulatory goals for energy efficiency.

An Optimal Incentive Mechanism? Conclusion and Suggestions for Study

While unit costs and (particularly) benefits of energy efficiency vary across the country, the wide range of performance incentives also reflects a lack of consensus among regulators as to appropriate incentive levels. We believe our research provides a solid analytic and data-driven framework to increase confidence in the determination of optimal incentive mechanisms.

Our research determined that the process for developing benchmarks for performance incentives consists of three basic steps: establishing standard metrics for measuring shareholder incentives from efficiency programs; selecting criteria for identifying comparable utilities; and establishing benchmarks for each metric in each comparison group. We leave the development of proposals for benchmarks for each metric in each comparison group to other researchers.

It was not within the purview of this analysis to determine the characteristics of the optimal incentive mechanism. The examples we found represent the best efforts of regulators and other stakeholders to create an optimal incentive mechanism within the specific constraints they were facing. Our research revealed that the following features are often considered during design of performance incentives and thus are likely to be necessary components of the process for defining an optimal incentive:

- The inclusion of a firm cap to limit ratepayer exposure;
- Calculations are based on evaluated, as opposed to estimated results;
- The evaluation is done in a timely manner;
- The incentive mechanism aligns with the goals of the implementing agency;
- The incentive calculation aligns with the goal metric, i.e. if goals are gross savings, then the incentive is based on gross savings; and
- In cases where cost-effectiveness is a primary concern, an incentive based on net benefits may be more closely linked to the goals than one based on program costs.

Over time it is probable that there will be regulatory and industry convergence on these and other issues related to the means of balancing the acquisition of energy efficiency with the financial systems that have enabled creation of the world's premier energy distribution system.

Near-term Research

In the near term, we see two critical research tasks. The first would be the collection of additional data collection to permit a refined the analysis on the impact of circumstantial variables on performance incentive design. The second would be a comprehensive collection of information on actual program performance under various incentive mechanisms, that is, the actual incentives approved by the regulatory body, and the impact on shareholder value. This information would allow for evaluation of the impact of incentive structures on management priorities. It is also important to note that while we have framed this discussion within the context of the regulators other stakeholders, such as legislators, advocates, and consumers may have frequent and far-reaching influence on the shape of public policy. Their understanding of the issues at stake may be of even greater relevance to achieving a major increase in energy efficiency at the state level than the incentive mechanisms discussed herein.

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