An Assessment of California's Energy Efficiency Incentive Mechanism

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ABSTRACT

The California Public Utilities Commission (Commission or CPUC) adopted an energy efficiency risk-reward incentive mechanism in September 2007 as a key policy tool to motivate a more vigorous pursuit of energy efficiency activities by utility program administrators. By January 2009, just 15 months after it was adopted, the incentive mechanism had become so complicated, controversial, and ineffectual that it was suspended indefinitely. This paper provides the CPUC Energy Division staff's overview of the factors and events that led to the failure of the incentive mechanism and some suggested approaches for improvements. In particular, the paper outlines key components of a simplified and streamlined incentive mechanism whereby the utilities regulated by the CPUC may qualify for regularly scheduled minimum earnings as an incentive for meeting adequate performance standards, and potential bonuses for achieving superior performance. This simplified and less controversial approach is contrasted with the current system of incentives based on the minutely detailed verification and calculation of energy savings.

Introduction

The motivation for changes to the incentive mechanism arises from concerns that it may not be the most effective means of encouraging the investor owned utilities (IOUs or utilities) to pursue strategic initiatives and market transformation activities envisioned by the California Energy Efficiency Strategic Plan (CPUC 2008), and other desired program activities which do not have immediate and easily quantifiable energy benefits. Improvements to the incentive mechanism are also necessary in order to re-focus the interactions between regulatory staff and their EM&V consultants, the IOUs, and interveners on improvements to the energy efficiency (EE) portfolios designed to better implement the CPUC energy resource loading order policy, reduce greenhouse gas (GHG) emissions, and maximize the return on ratepayer investments in energy efficiency. Disagreements concerning the application of EM&V results, as they relate to the incentive mechanism calculations and related policies, have consumed an unacceptable level of scarce staff resources for all organizations involved. An improved mechanism is needed to focus these resources towards progress on the CPUC policy objectives.

Aligning the Incentive Mechanism with CPUC Policy

The intent of the energy efficiency incentive mechanism is to provide the IOUs with an earnings potential that is directly related to the success of their energy efficiency portfolios. This earnings potential is thought to encourage IOU management, shareholders, and the financial and energy utility industries to make energy efficiency a core business pursuit within their organizations. The incentive mechanism is viewed as one of the key policy tools motivating the IOUs to undertake their best efforts in implementing the energy efficiency activities that support the Commission's energy resource loading order policy. Energy efficiency, as the first loading order resource, serves the dual purpose of decreasing GHG emissions as well as minimizing future energy supply cost increases to ratepayers.

[1] This paper is based on a CPUC Energy Division staff white paper that was originally presented on April 1, 2009 within the CPUC's energy efficiency proceedings as a proposal for improving the incentive mechanism. Certain conclusions made in this paper are those of the author alone and may not represent the views of the CPUC, its Commissioners, or the Energy Division.

The role of EM&V within the existing incentive mechanism is primarily to develop gross energy impact estimates, including magnitude, load-shape, and lifetime, for the full range of energy efficiency measures in the IOU portfolios; to estimate attribution, or the influence the IOU portfolio has on observed changes in energy use; and to verify installation claims for energy efficient measures and activities reported by the administrator. The EM&V activities include on-site audits and surveys, on-site measurement of existing and new equipment performance, as well as extensive data analysis and modeling needed to project sampled data into current and future portfolio participant populations and assess future potential. These activities are used not only for the RRIM calculations but are also expected to provide an accurate estimate of energy savings, thereby reducing the uncertainty of savings estimates and increasing the reliability of energy efficiency estimates used in resource planning. Over the long-term, EM&V provides timely and accurate estimates to improve the load forecast estimates and procurement planning, which are activities outside of the RRIM. Additionally, these estimates are used to calculate incentive mechanism results for possible payments or penalties to the utility portfolio administrators. The foundation of this design is the theoretical alignment of utility, ratepayer, and environmental interests.

Flaws in the Current Incentive Mechanism

The implementation of this mechanism, however, has revealed fundamental flaws which lead Energy Division to propose that the EM&V process, at least as it is currently designed and administered, cannot serve as a tool to simultaneously determine incentive awards or penalties and produce accurate estimates of energy savings without protracted disputes concerning the magnitude of specific values or the fairness of allowing those values to be updated and applied retroactively. Energy Division believes that the current incentive mechanism does not optimally align the IOU management and shareholder interest to serve the loading order policy, the California Energy Efficiency Strategic Plan, or the GHG emissions reduction goals mandated by AB32[2]. The load reductions attributed to the IOU portfolios must be accurate and reliable to be taken seriously in resource planning activities. Similarly, the estimates of GHG emission reductions must be genuine if California's claimed progress in reducing GHG emissions is to be taken seriously. To be effective, the incentive mechanism must focus the IOU energy efficiency efforts on providing genuine and accurately measured progress towards these two objectives. Energy Division's primary concerns regarding the current incentive mechanism are twofold: first, implementation of the incentive mechanism has become a diversion that has consumed too much valuable and limited staff time within the IOUs, other stakeholders, and the CPUC, and second, the incentive mechanism has focused attention on the details of the calculation of incentive amounts rather than on the delivery of exceptional programs that reduce energy consumption and GHG emissions, and contribute to laying the foundation for fundamentally changing the way Californians use energy.

The current incentive mechanism utilizes a Minimum Performance Standard (MPS) to establish if a utility should receive incentives or penalties and what the earnings rate should be. The MPS value is based on the utility's kWh, kW and therm accomplishments relative to the CPUC adopted savings goals for each of those metrics. Incentive payments and penalties are calculated using the earnings rate established by the MPS multiplied by a monetized Performance Earnings Basis (PEB). The PEB value is currently intended to be an accurate measure of the net resource benefits created by the energy savings and related GHG emission reductions caused by the portfolio of energy efficiency programs.

The implementation of the IOU energy efficiency portfolios largely involves the installation of millions of individual measures across the state. Each of these installations can be any one of thousands

[2] The California State Assembly Bill 32, entitled the "California Global Warming Solutions Act of 2006" establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases.

of individual measures, each with an equipment cost, an installation cost, an estimated useful life, an energy impact estimate (kWh and/or Therm), and an annual impact load profile that must all be known or estimated in order to convert the energy load impacts to both an avoided resource cost and GHG emissions reduction. For each measure that is installed, it must be determined if the installation can be attributed to the IOU portfolio or if the installation would have happened without the IOU activity in order to determine the free-ridership level, or the net-to-gross ratio. Measure load impacts can vary by geographic location of the installation as well as the type and age of the facility where the installation takes place. Finally, program effectiveness and savings persistence have behavioral dimensions that are difficult to predict and measure.

The calculation of the current MPS and PEB metrics is a complex undertaking involving large data sets composed of highly variable parameters. Additionally, many of the parameters for individual measures are subject to annual variations due to market changes, product changes, and variations in installation methods. Although it has been accepted practice to express the portfolio MPS and PEB results as point values, these values have significant levels of uncertainty as well as annual variation. These levels of uncertainty and annual variation make their use problematic within an incentive calculation framework with results that can vary across the range of uncertainty and annual variation for each parameter. Thus, the results of the MPS and PEB calculations will always be highly contentious when large dollar payments or penalties are based on such calculations.

The CPUC's current policy rules articulate the overriding goal of energy efficiency as the pursuit of all cost-effective energy efficiency opportunities (CPUC 2005 and State of California 2005). However, the current mechanism, where incentive payments are based on net-benefits, works in opposition to this policy goal by incenting the IOUs to prioritize the pursuit of the most cost-effective measures, or "low hanging fruit." The most cost-effective measures provide the highest net-benefits, and thus the highest potential for earnings, while minimally cost effective measures produce net-benefits of nearly zero. The highly cost-effective measures should be pursued, but may require less IOU program support and are more likely to have high free-ridership levels because a higher proportion of customers are more likely to purchase efficiency measures with short paybacks in the absence of the program. Under a mechanism based primarily on producing net-benefits, the IOUs are provided a direct signal to go after the low hanging fruit and avoid the harder task of going after less cost-effective or more comprehensive measures. This is precisely why the CPUC excluded the costs of the Emerging Technology Program from the net-benefits calculation in 2005. Emerging technologies and new and innovative programs with very high savings potential, but with low market penetration and low cost effectiveness, are examples of the efforts the Commission has encouraged in order to help increase penetration, bring cost down through increased volume, and foster rapid technology improvements.

The current incentive mechanism was intended to be based upon program accomplishment claims subjected to an ex-ante update and an ex-post true-up. During the development of the current incentive mechanism it was assumed that the major difference between ex-ante IOU claims and ex-post evaluated results would be primarily attributed to the difference between estimated and actual measure installations. If individual measure load impacts are well known from past measurement activities, the difference between IOU gross impact claims and ex-post results for a particular measure or intervention will be minimal. Due in part to the large increase in funding for energy efficiency programs, however, many measures in the current portfolios have not been subject to adequate field measurements in order to establish accurate ex-ante estimates of gross load impacts, and they are being installed in a much wider range of building locations, types, sizes, and age than ever before. Thus the gross impacts are subject to a larger variation than in the past. Rapid market changes for many key portfolio measures (i.e. CFLs) result in ex-ante free-ridership assumptions for some program strategies that may significantly underestimate current market conditions.

The complexity of the calculations required by the current incentive mechanism combined with the time-lag associated with conducting the EM&V studies needed to support accurate ex-ante values has created a dilemma for the IOUs, other stakeholders, and the Commission. While it is reasonable to insist that the IOUs proactively manage their portfolios in reaction to changes in market conditions and the latest technical estimates of load impacts, it may not be realistic to expect utility managers to easily accept the most accurate impact estimates as a basis for the determination of incentive calculations when the ex-ante starting point estimates, as well as the CPUC adopted goals, are out of sync with the EM&V results used to establish net and gross impacts. Thus, while the EM&V ex-ante update and ex-post results may represent increased accuracy relative to current measure impacts and market conditions, the IOUs may be required to use updated results to track performance against CPUC adopted goals that have not been similarly updated. Expecting the IOUs to perform their own updates so that their ex-ante values better reflect actual accomplishments represents a conflict-of-interest since those updates may reflect decreased savings and it is especially difficult when reliance on such an update will guarantee that no incentive payments will be awarded and possible penalties will be imposed if the CPUC does not correspondingly update the adopted goals against which the IOU updated values will be compared. In addition, it is likely to be politically difficult within the IOUs' organizations to adopt updates that negatively affect the eligibility for incentive earnings awards.

Energy Division believes that the "risk" and "no reward" constructs of the current incentive mechanism may not serve to achieve either the CPUC loading order policy or the GHG emissions reduction goals. These elements have instead resulted in protracted arguments centered around the details of calculating incentive and penalty payments. Risk would be more effectively embodied in the real prospect of the CPUC or the Legislature transferring the energy efficiency portfolio administration to a third party in the event of prolonged unacceptable performance by the IOUs. Indeed, given the central role that the ratepayer funded energy efficiency programs have in resource procurement, bill savings, and reducing GHG emissions, the Commission should be fully prepared to make such a move if the IOUs perform well below expectations.

Given the multitude of complex and interrelated problems burdening the existing incentive structure, the Energy Division has recommended that the current incentive mechanism be wholly replaced with a greatly simplified structure that provides predictable and regularly scheduled opportunities to receive prescribed minimum levels of incentive earnings for meeting adequate performance standards based upon simplified and straightforward EM&V protocols, plus potential bonuses for superior performance of selected non-resource programs, market transformation programs, and strategic initiatives. To qualify for these bonuses, the utility would be required to satisfy a more rigorous set of performance standards. Such a structure balances the streamlining benefits of a simplified incentive structure with the performance enhancing benefits that require more rigorous EM&V. This approach has a better chance of being aligned with CPUC policy priorities and fostering cooperation and constructive interactions between all stakeholders and the CPUC.

In preparing this paper, the Energy Division originally contemplated formulating an incentive mechanism similar to the existing mechanism, but with only minor adjustments. Our tentative proposal was to keep the existing incentive mechanism structurally intact and only modify the parameters used to calculate the PEB (ex-ante instead of ex-post) or re-state the savings goals to be consistent with current ex-ante parameter estimates, as well as other minor modifications. From the discussion above, we have emphasized that the current incentive mechanism structure of an MPS based on savings goals and a PEB based on net benefits offers little hope of quick improvement and a return to the CPUC's policy objectives via small fixes or tweaks. We come to this conclusion because the current mechanism structure:

1. Is not able to place an appropriate value on all desirable program activities, thereby unintentionally favoring "resource" programs over "non-resource" programs.

2. Relies on overly complex calculations to implement.
3. Is based on calculations that have high uncertainty relative to the incentive/penalty transition points of the earnings curve.
4. Is based on performance measures that are internally inconsistent - updated impacts measured against static goals.
5. May encourage IOUs to bias claimed impacts upward, further encouraging challenges to the ex post results.
6. Is inherently unpredictable, therefore the performance results and uncertainty of performance metrics creates a highly contentious environment.

Matching Measurement and Risk for Energy Efficiency Portfolio Administrators

The performance of energy efficiency programs is subject to a high degree of uncertainty, which is likely to grow as program funding continues to increase, new technologies are commercialized, policies evolve, markets and customer preferences change, energy efficiency funding sources and other market actors increase and diversify, and public awareness of the risks of climate change and the benefits of energy efficiency spreads. EM&V should be applied to these areas of uncertainty, and the results should be reported as accurately as possible in order to better understand the impacts, move program resources into the most effective activities, and increase the reliability of energy efficiency program impact estimates. This framework is not entirely compatible with an incentive mechanism that aims to provide regular and predictable earnings to the utilities, who are assumed to have the capacity to manage all the uncertainty through shifts in program funding and changes to program strategies. As previously discussed, the pursuit of accurate and reliable information on program impacts has the potential to take more time and resources, thereby creating more risk and uncertainty as to the timing and magnitude of potential incentive earnings. The investor's perception of such risk and uncertainty may have the undesirable effect of reducing the administrator's incentive to pursue energy efficiency measures deemed to have excessive regulatory risk. Thus, beyond a certain appropriate level, excessive requirements for detailed program impact results may be somewhat at odds with promoting incentives for the desired behavior based on a high stakes incentive mechanism that has a significant downside risk and is based directly on net-benefits calculated from the results of program impact measurement.

If the Commission policy is intended to provide IOUs with the opportunity to earn regular and predictable earnings, then the earnings mechanism should not be dominated by a formula that is known to embody a high degree of uncertainty and variability, elements of which are not fully manageable by the utilities. Certainly the utilities should be expected to re-evaluate and update their portfolio strategies and measure mixes in light of changing market and technology parameters on an ongoing basis. However, the incentive mechanism should reward them for those adjustments without penalizing them for imperfect projections of future market and technology changes. Decoupling the measurement of savings and cost-effectiveness from payment of shareholder earnings should remove disincentives to accepting and making productive use of the information flowing from the EM&V work, regardless of the results. At the same time, there is important value to incorporating the principle of performance into the incentive structure. A key question is the degree to which energy efficiency savings determined through EM&V studies is a sole or contributory element in determining shareholder earnings.

Recommendations for Achieving Improvements to the Incentive Mechanism

Base Earnings and Performance Bonuses

The Energy Division recommends incentive payments be partitioned into:

1. Base incentive earnings that are based upon simplified and more broadly defined performance standards which can be adequately measured and reported within a relatively short period of time and;
2. Bonus incentive earnings that are based on superior accomplishment of more specifically defined and rigorous performance standards.

Instead of meeting detailed specific energy savings thresholds in order to qualify for incentives, the utilities would be provided the opportunity to qualify for a base level of incentive earnings upon meeting a simplified and streamlined set of criteria. The required criteria and the eligible amount of base earnings would be identified by the Commission at the start of the program cycle. The Commission can set this base earnings payment at an amount equivalent to one or a mix of the examples below:

1. The return on investment the utilities would likely have earned had the same level of funding been allocated to supply-side resources, such as a power plant. This amount should be developed with full awareness that ratepayers are directly funding the full cost of the energy efficiency portfolios, in contrast to recovery of shareholder capital investment in a power plant that is recovered through a rate of return and depreciation after a power plant begins delivering energy.
2. Management fees typically paid in the energy and financial sectors. The fee could be based upon the level of funds managed, such as one or more of the following:
    a. A percentage of portfolio expenditures that are direct investments in efficiency with a cap on non-incentive costs (administration or overhead) as a percentage of counted expenditure for this purpose.
    b. A percentage of the net participant expenditure, to reward the utilities for encouraging customer investment in energy efficiency.
3. An amount deemed just and reasonable by the Commission.

The success of this revised incentive mechanism would depend upon the careful design of appropriate performance criteria that the utility or program administrator must satisfy in order to be awarded the eligible level of base incentive earnings. As a general matter, Energy Division believes that the criteria should, at a minimum, include rigorous financial reporting requirements, financial audits, thorough compliance with Commission Decisions, and full cooperation with the Commission and its agents to ensure that ratepayer investments in energy efficiency are being spent and managed in a responsible and productive manner. Satisfying the prescribed minimum performance standards should be a precondition for authorizing base earnings. However, these minimum performance standards should not be tied to attainment of exceptionally rigorous savings goals as in the current situation.

Under this proposed incentive mechanism structure, the IOUs will also have the potential to earn "bonus" earnings based on the superior performance of selected non-resource programs, market transformation programs, and strategic initiatives, which will be evaluated relative to carefully developed performance metrics. The metrics used to evaluate performance are expected to be based on the program theory articulated by program managers and approved by the CPUC, focusing on performance metrics that are manageable by the IOUs. Bonus earnings will only be granted at the end of the program cycle, and only if the Commission determines that the performance targets have been achieved.

Cost-Effectiveness Requirements

The cost effectiveness tests required by the Commission have been used as a screening mechanism for program funding, a tool for quantifying the performance and measuring the efficiency of

programs and portfolios, and as a means for determining the level of earnings the utilities should be granted. As discussed below, the Energy Division recommends that cost-effectiveness estimates no longer be used in determining utility incentive earnings. However, there are reasons to use cost-effectiveness for other purposes.

There are many limitations to relying on existing cost-effectiveness tests if the objectives of energy efficiency move beyond least-cost energy procurement to promoting market transformations and climate change mitigation:

1. The cost-effectiveness tests cannot accurately place a value on many indirect benefits of the program, even if benefits are known to exist.
2. The risks and costs of global climate change may not be adequately and accurately valued.
3. The cost-effectiveness tests are complicated, data intensive, and can be manipulated.
4. Basing earnings on the current cost-effectiveness tests does not encourage the optimal mix of program activities because:
    a. Current tests do not adequately value the benefits produced by all desirable program activities and
    b. Providing incentives to maximize net benefits often leads to "cream-skimming".

Given these concerns, staff propose consideration of the following options:

1. With regard to the RRIM, the existing cost-effectiveness tests should not be used as the primary tool to calculate utility incentives.
2. The Commission should thoroughly re-examine the existing cost-effectiveness tests to determine their applicability to valuing indirect benefits if they are to be used for anything other than a portfolio level minimum threshold screening mechanism.

Rewarding Desirable Market Transformation Activities

A key objective of energy efficiency program interventions is to increase customer awareness, acceptance, and adoption of energy efficiency measures. The IOU portfolios should be designed to aid the transformation of energy efficiency markets such that portfolio resources directed towards program strategies and technologies that have gained wide acceptance in the marketplace can be modified, phased out, or shifted to newer technologies and technologies in the earlier stages of adoption. Successful market transformation strategies increase free-riders, which results in lower savings impacts attributed to the IOU portfolio. One way to acknowledge successful market transformation activities is to provide bonus earnings based on performance measures (such as goals directly tied to the adoption of energy efficiency products and services, with progress towards those goals being tracked through market saturation and market effects studies). The improved incentive structure proposed in this paper coupled with strategic market-based research, performance measures, and rigorous oversight will encourage an on-going re-evaluation of the portfolio to phase in measures and program strategies with high potential and low market acceptance, and to phase out measures that no longer require program support.

Rewarding Customer Investments in Energy Efficiency

One measure of IOU portfolio success not considered in the current RRIM is the amount that program participants invest in energy efficiency. A mechanism that provides increased incentive earnings for increased customer investments attributed to the program may focus the IOUs on market transformation. Using the net customer investment as a component of the base earnings may potentially provide this policy signal. Energy Division recommends that this concept be explored in greater detail by the parties.

Savings Goals

The cumulative energy savings goals adopted by Decision 04-09-060 and modified in Decision 08-07-047 should continue to be the official CPUC savings goals and input for the long-term procurement proceeding forecast until the Commission decides to make modifications to the methods by which goals are estimated and used. The Commission should maintain the expectation that the goals will be met, but should modify its expectations based on the EM&V results as they become available. To that end, we recommend that the savings goals be regularly adjusted by EM&V results, especially those related to attribution. As naturally occurring savings increase for a measure or end use, the portfolio strategy for that measure or end-use must be adjusted in order to continue to obtain attributable net impacts, and the savings goals should be correspondingly adjusted. Similarly, as new technologies become viable, the goals should be adjusted to take into account the increased potential these new measures represent.

Consumption Targets

Energy Division believes that developing or setting consumption-based targets may be appropriate for tracking portfolio performance relative to GHG emissions reduction goals. Energy efficiency is recognized as one of the means towards the end of reducing absolute levels of energy consumption (Moezzi & Diamond 2005, Deumling 2007) . Because the Commission intends to achieve a large part of the utility sector GHG emissions reduction goals with energy efficiency, it may be desirable to set targets and track total customer energy consumption metrics, in addition to estimating energy savings against a baseline as a proxy for emissions reductions. The established definition of energy efficiency, which does not necessarily consider absolute reductions of energy use, may not be an adequate policy tool for hedging against the risk of climate change, despite the significant improvements in nominal efficiencies of buildings, appliances, and other energy-using products.

The programmatic focus on technological solutions is designed to induce customers to invest in equipment that reduces energy and demand relative to standard practice or minimum code requirements for equipment that produces the same level of energy service. However, this approach can still reward customers for purchasing energy-efficient yet feature rich and large appliances with high energy use rather than choosing the lower use products that meet the customer's minimum requirements. Larger houses, luxury appliances, and other such choices will work against established GHG emission reduction goals. The IOU portfolios could contain program elements and program designs which are more directed towards reducing absolute energy use rather than just improving the efficiency of a particular customer choice. This might be accomplished by reducing or eliminating incentives when the customer choice is a premium product with energy consumption or demand well above the market average choice.

To establish consumption targets, the CPUC-adopted energy savings goals can be augmented to include metrics that reflect reduction targets in (absolute) energy consumption statewide, within each IOU service territory, or by tracking energy intensity indicators[3] within particular market sectors. As a pilot study, a portion of the proposed bonus incentive earnings could be allocated to the IOUs'

[3] Energy intensity, the ratio of energy consumption to a unit of measurement (e.g., floor space, household, number of workers, etc), is one metric that can be considered as proxy for energy consumption. Energy intensity indicators can be defined by customer type or market sectors (e.g., kWh usage per sq. footage of building space), baseline values developed before programs are launched, and then evaluated after the programs are implemented to determine change in energy consumption level. A decrease in energy-intensity over time may correspond to an increase in energy efficiency, energy conservation, and/or other structural factors that drive the reduction in energy consumption.

achievement of metrics reflective of total energy consumption reductions by program participants. Such a pilot study would start with a review of how other entities have used this approach.

There are caveats with this approach. Variables other than IOU program interventions can affect a particular customer's energy usage over time. The condition of the economy, changes in demand for particular products and services, energy costs, and a wide range of variables other than energy efficiency improvements will affect total energy consumption. These variables would need to be explicitly analyzed and considered in explaining any observed changes in energy consumption levels. The "signal" of the IOU program energy efficiency activities may be lost in the "noise" of the total annual consumption variations, possibly impeding the use of consumption data to measure structural changes in consumption attributable to energy efficiency activities. Evaluation activities would need to expand to include econometric techniques to quantify reductions in total energy consumption

Conclusions

The California Public Utilities Commission's recent experience with the energy efficiency risk-reward incentive mechanism demonstrates that even the most theoretically elegant, intensively researched, and meticulously vetted mechanism can quickly fall apart when put to practice. The Energy Division's analysis has identified numerous complex and interrelated problems that can frustrate attempts to set performance incentives for the administration of energy efficiency portfolios. Relying on the quantification of savings as the sole measure of portfolio performance can contribute to discouraging the design and implementation of comprehensive portfolios by profit seeking utilities. The inherent range of uncertainty associated with energy savings forecasts, the program implementation processes, the measurement of portfolio savings, and attribution of impacts is not consistent with the utility industry's stated need for regular and predictable earnings or the expectations of policy makers who are responsible for the oversight of utility programs.

Multiple factors outside of a utility's short-term management domain can influence program impacts. These factors must be researched and understood, and a process put in place to use that knowledge to refocus program interventions more effectively. Restricting the measurement and evaluation of portfolio impacts on the production of scientifically based point estimate of earnings compared to static goals, when many key parameters cannot be precisely known, practically ensures that EM&V will remain the hub of potentially irresolvable disputes between countervailing interests. There is indeed a real risk that these disputes and controversies will result in constraints being placed on rigorous and forward looking EM&V at a very time when such creativity is most needed. These are critical problems that can slow down progress in states who have recently set ambitious energy savings goals.

The author recommends consideration of more predictable performance metrics for utility energy efficiency programs that are designed to incent comprehensive impacts and the broader acceptance and use of rigorous EM&V research. This paper has presented a set of options that might be considered for the State of California. We have no pretence that any of these options are "magic bullets", nor do we believe that they are assured to not create unanticipated problems and controversies of their own. However, we remain hopeful that better approaches for incenting the full range of desired outcomes without sacrificing our efforts to enhance evaluations are possible.

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