

The Continued Value of Evaluation in California's Shareholder Incentive Mechanism

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ABSTRACT

In 2007, California began granting shareholder incentives based on evaluated energy efficiency performance. Called the Risk Reward Incentive Mechanism (RRIM), this policy was controversial and led to re-hearings of previous Commission decisions. California's new mechanism, called the Efficiency Savings and Performance Incentive mechanism or ESPI, hopes to be less contentious. This paper will focus on how California developed a process to utilize evaluation results in a timely manner in order to determine hundreds of millions of dollars of ESPI incentive awards. This paper will briefly describe California's recent history with shareholder incentive mechanisms and will compare the RRIM and ESPI components. The paper will also describe the database and aggregated reporting that allowed stakeholders to quickly understand the results leading to a more transparent and less controversial process. Finally, the paper will include lessons learned from the first two years of implementation for other states that may be planning a shareholder incentive process and want to include evaluated results as an element of the incentive mechanism.

Introduction

Over the past ten years, California has had two shareholder incentive mechanisms in place to motivate utilities to prioritize energy efficiency goals. Evaluation has played a role in both mechanisms, but with different levels of utility. This paper compares the two mechanisms and recounts the lessons learned from the first two years of implementing the new mechanism, with the hopes that other states can learn from this past ten years of experience.

Brief History of California's Shareholder Incentive Mechanism

In 2007, the California Public Utilities Commission (CPUC) adopted a shareholder incentive mechanism that "creates incentives of sufficient level to ensure that utility investors and managers view energy efficiency as a core part of the utility's regulated operations that can generate meaningful earnings for its shareholders" (CPUC 2007). Incentive earnings, capped at \$450 million statewide for the three year cycle, were to be awarded on an annual basis. Termed the Risk Reward Incentive Mechanism (RRIM), the Commission also realized that the RRIM must protect ratepayers' financial investments by ensuring that program savings are real and verified. With enhanced financial consequences of ex post results, the impact evaluations covering the 2006-2008 program cycle became a contentious focal point during earnings deliberations.

Figure 1 succinctly captures the RRIM design with the percent of CPUC goals on the horizontal axis and the incentive earnings or penalties on the vertical axis. The "step-wise" nature of the RRIM contributed to the controversy as the difference between a 64% and 65% of goal achievement possibly meant millions of dollars in penalties. Similarly, 85% of goal achievement resulted in the "dead band" with no earnings or penalties, but 86% of goal achievement possibly meant millions of dollars of earnings (CPUC 2007).

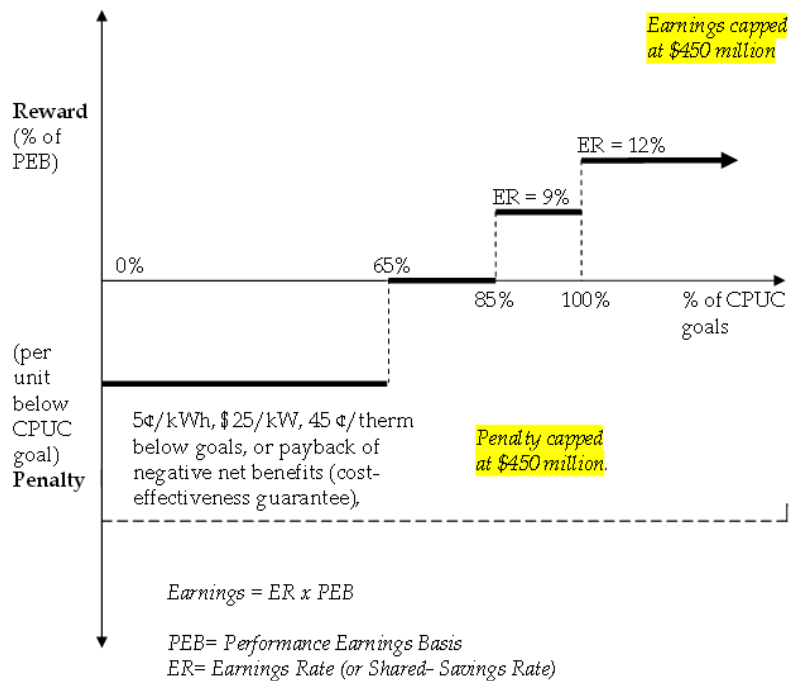


Figure 1 - RRIM earnings structure. Source: CPUC 2007.

The CPUC began managing impact evaluation contracts during the 2006-2008 program cycle, while the utilities managed process evaluations. These impact evaluation studies determined the ex-post unit energy savings, net-to-gross ratios, realization rates, and installation rates for numerous measures installed in the residential, commercial, industrial, and agricultural sectors. Since the RRIM required determination of lifecycle net benefits, staff needed to process the impact evaluation results for the entire portfolio through the CPUC’s cost effectiveness calculator. The calculator uses the Total Resource Cost test to calculate a monetized benefits number based on the avoided costs resulting from the energy savings delivered through the EE programs. This process informed the Energy Division’s 2006-2008 Evaluation Report and corresponding Evaluation Reporting Tools datasets, which were to be used for determining the interim and final RRIM payments.

Between 2008 and 2010, the CPUC adopted two interim payment decisions and a final “true-up” decision that awarded a total of \$211 million dollars in shareholder incentives to California’s four largest utilities¹. The original intention of the RRIM was to utilize full ex post results determined by the impact evaluations. However, in part because those evaluations proved to be contentious among stakeholders, the Commission decided to base the award on ex ante savings modified only by an installation rate adjustment.. In awarding the interim payments, the Commission reasoned that the earnings must accrue each year and delays in the evaluation based earnings reports warrant awarding interim rewards based on utility self-reported values, subject to a 65% holdback (CPUC 2009). For the final “true-up” award, the Commission found the RRIM process was unfair to the utilities due to the huge swings between the utility reported numbers and the final evaluated results, and the fact that the utilities were not able to react to the impact results with enough time to modify their programs. The Commission found it was more reasonable to award earnings based on the numbers and assumptions in place at the time the portfolio was adopted in 2005,

¹ Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas and Electric Company, and Southern California Gas Company.

except for ex-post updates to the installation rates (CPUC 2010). Between 2009 and 2011, The Utility Reform Network (TURN) and/or the Office of Ratepayer Advocates (ORA) filed applications for rehearing of the three decisions that awarded the RRIM payments. TURN and ORA alleged that the three decisions awarding shareholder payments were in violation of multiple Public Utility Code sections and were not based on evaluation, measurement and verification (EM&V) data and resulted in rates that were neither just nor reasonable. In 2015, the CPUC granted the rehearing and opened a proceeding to determine if any of the awarded payments should be returned (CPUC 2015a). In March 2017, the CPUC approved the last of three decisions requiring the utilities to return almost 24% of the earnings, or \$50 million, thus closing the RRIM chapter after almost 10 years (CPUC 2017).

Current Shareholder Incentive Mechanism

In 2013, the CPUC adopted a new mechanism, called the Efficiency Savings and Performance Incentive mechanism or ESPI. The ESPI mechanism envisioned to have: (1) clear performance goals; (2) a clear understanding of how performance will be measured in relation to goals; (3) a timely and transparent EM&V process; and (4) incentive earnings opportunities sufficient to motivate IOU performance. This new process awarded up to \$178 million of total payments into four performance categories: (1) EE resource savings; (2) ex ante review performance; (3) building codes and standards; and (4) non-resource programs (CPUC 2013). The EE resource savings category includes a combination of ex-ante savings and ex-post verified savings. Given the importance of utility programs to generate EE savings, this category has the largest incentive set at 9% of resource program expenditures. Category number 2, ex-ante review performance, is designed to reward the IOUs for exercising the highest standard of care in developing ex ante estimates. This category is capped at 3% of resource program expenditures. Category number 3, building codes and standards, is designed to reward savings from codes and standards advocacy programs and is a flat payment equal to 12% of the codes and standards expenditures. Finally, category 4, non-resource programs, is designed to provide some earnings for the IOUs to pursue critical programs that support energy efficiency activity, but may not immediately result in direct energy savings (e.g., training programs). This category is a flat payment equal to 3% of non-resource program expenditures (CPUC 2013). This paper will focus on performance category (1) EE resource savings for ex-post verified savings. This ESPI mechanism was applied to the 2013 and 2014 program years, which were evaluated in 2015 and 2016, respectively.

For the EE resource savings category for a particular year, all savings could be categorized in one of three groups: 1. Savings from custom projects, 2. Deemed measure with ex-ante parameters that the Commission considers uncertain, and 3. All other deemed measures that will be awarded based on ex-ante savings parameters. This last group of *all other deemed measures* is not subject to ex-post evaluations and thus will not be discussed in this paper. The ESPI earnings mechanism must ensure that any earnings from the three savings groups are not double counted. To ensure that ESPI earnings are based on independently verified data, the Commission determined that groups 1 and 2 will require ex post evaluations. Custom projects are large projects with calculated savings with substantial savings impacts that warrant ex post review. For group 2, *deemed measure with ex ante parameters that the commission considers uncertain*, the Commission determined a measure is sufficiently uncertain if the net lifecycle savings is based on ex ante reported parameters that may be as much as 50% or more over or under estimated. For example, a measure with three measurement parameters, each with 20% uncertainty, would exceed the 50% uncertainty threshold and be subject to ex-post evaluation (CPUC 2013).

Each year, Commission staff issues a list of uncertain deemed measures that require ex-post evaluations. This list is based on an uncertainty analysis of all deemed energy savings claims that estimates the percent of contributions to total uncertainty by measure group in kWh, kW, and therms for each

program administrator’s portfolio. The uncertainty analysis considers five parameters: installation rate, unit energy savings, gross realization rate, net-to-gross ratio, and expected useful life. As a result, one program administrator could have one parameter for one measure group on the uncertain measure list, but that same measure group may not be uncertain for another program administrator. The analysis also weighs the savings delivered by a particular measure or measure group. In this way, a highly uncertain, but very small, measure does not become the subject of an expensive evaluation. This approach helps the Commission direct evaluation funding strategically on measures or parameters that are anticipated to have the largest impact in reducing total portfolio uncertainty. Table 1 shows the 23 measure groups that were on the uncertain measure list for 2013-2014 (CPUC 2013):

Table 1 – 2013-2014 Uncertain Measures subject to ex post evaluation

(Non-Res)LED	De-lamping of T12 lamps in existing fixtures	Mini-splits	Screw-in CFLs
(Non-Res)Screw-in CFL	Home Upgrade Program	Non-res New Construction	Sprinklers
Behavior Programs	LED Lamps	Occupancy sensor lighting control	T5 fluorescent lamps and fixtures replacing metal halides
Computer network and workstation power management software	LED Night Lights	Pipe insulation	Water Savings Kits
Custom Projects	Multifamily variable drive Pool Pumps	HVAC Quality Maintenance	

In 2015, the CPUC implemented a “rolling portfolio cycle” for regularly reviewing and revising portfolios. Previously, the Commission adopted 2-year or 3-year portfolios and the evaluations would be conducted near the end of the portfolio cycle (CPUC 2015b). With this rolling portfolio, the CPUC authorized 10 years of programs and established a process to update the portfolio every year to make changes, if necessary, rather than stopping one program cycle and then starting up another program cycle. Embedded within this framework is a “bus stop” or a hard due date for when impact evaluations must be submitted each year to be considered for the ex-post portion of the ESPI payment. If an impact evaluation report was not issued by the bus-stop date, those results would be considered in the following year’s bus stop. The Commission chose March as the bus stop date to allow evaluations to collect some winter months for weather sensitive measures. While this truncates the evaluation schedule and thus limits the amount of field work that can occur in the year leading up to the bus stop, it provides a certain end-date for the evaluations, which is critical to completing the ESPI process and informing savings parameter updates in time for implementation the following year.

The tight evaluation schedule forces the evaluations to prioritize the ESPI impact evaluations above all other concurrent studies, such as market studies or lab studies, that do not have a time sensitive due date. This prevents the quality of the impact evaluation from being compromised and allows completion of the non-time sensitive studies at a later date or with evaluation staff not specifically assigned to the ESPI schedule. Once the evaluations are finalized in March, Commission staff applies the individual measure group parameter results to the portfolio, creating an ex-post dataset. At this point, staff has ensured that any records that were subject to an ex-post evaluation were not double counted in the group of *all other deemed*

measures not subject to ex post evaluations, but earned an ex ante earnings as part of the EE resource savings category.

Between March and June, the Commission develops an ESPI database and an ESPI workbook that feed into an annual report called the Performance Statement Report (CPUC 2014a). The goal is to have one database that contains all the utility reported installations and savings for that year as well as all the ex-post parameter results from the impact evaluations. This process starts with the utility “tracking” database that represents all the energy efficiency installations and savings for a given program year. The utilities usually submit this database in March following the end of the program year. For program year 2013, the utilities would submit the tracking data in March 2014. Before the impact studies can begin, evaluators design samples based on the installations from the utility tracking data. Once they have the sample design, they begin conducting field work and ultimately produce impact evaluation reports with ex-post parameter results. The impact evaluation reports have all the details behind the ex-post parameters, but rather than having 23 different reports to cross-reference (for each uncertain measure group), the ESPI database has all the ex-post parameter results applied at the utility “tracking” database level.

In an effort to ensure parties were comfortable with the data that would ultimately be used for earnings, Commission staff shared the ESPI database with parties early in the process (CPUC 2014b). The ESPI database also includes pre-built queries that are used for other related deliverables, such as the Impact Evaluation Standard Reporting appendices (CPUC 2015c), the ESPI workbook, and the Performance Statement Report. Commission staff held public workshops throughout the process to familiarize parties with the structure and content of the ESPI database.

To make the performance goals clear to all parties, Commission staff created an excel workbook that included “live” ESPI earnings formulas and any modifications that were made to the earnings (CPUC 2014c). The numbers in the ESPI workbooks are created from the ESPI database, so a user would be able to track a number from the ESPI database to the earnings calculation in the ESPI workbook.

The basic ESPI earnings calculations are the sum of the unit of savings multiplied by the earnings coefficient:

$$\text{GWh Earnings} = \$2,525 \times [\text{Sum (Ex-Post Lifecycle Net Deemed GWh Savings)} + \text{Sum (Ex-Post Lifecycle Net Custom GWh Savings)}]$$

$$\text{MW Earnings} = \$6,200 \times [\text{Sum (Ex-Post Lifecycle Net Deemed MW Savings)} + \text{Sum (Ex-Post Lifecycle Net Custom MW Savings)}]$$

$$\text{Therms Earnings} = \$21,331 \times [\text{Sum (Ex-Post Lifecycle Net Deemed MMTherms Savings)} + \text{Sum (Ex-Post Lifecycle Net Custom MMTherms Savings)}]$$

Commission staff produces one workbook in Microsoft Excel for each utility as well as a statewide workbook. Each workbook has worksheets that calculate the earnings, the ex-post savings, the ex-ante savings, the percent of records evaluated versus passed-thru, the contribution of savings from the uncertain measures, as well as waterfall charts of evaluation adjustments (CPUC 2014c). The data and charts in the workbook are direct inputs into the Performance Statement Report. The workbooks, coupled with an advance review of the ESPI database, allow parties to replicate the ex-post earnings amount that Commission staff would ultimately recommend in the Performance Statement Report, as well as gain insights into many other aspects of measures, programs, and portfolios, by custom queries. By the time the draft Performance Statement Report is published, parties would have had three opportunities for public comment

and would have reviewed the full database and the workbooks resulting in fewer surprises. As a result, the 2014 Performance Statement Report generated very little controversy.

This graphic (Figure 2) captures all the previous steps mentioned and identifies which CPUC and Evaluation tasks happen during a given program year (in green). Every program year the evaluation for the previous program year begins, and the ESPI process begins for the program year from two years prior:

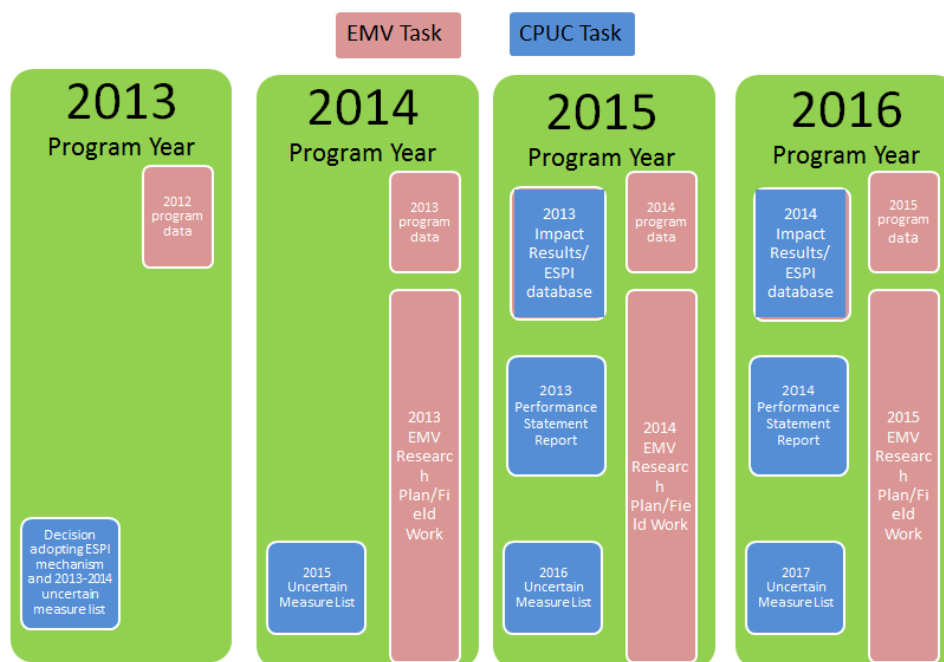


Figure 2 - ESPI activity by year.

Comparison of Shareholder Incentive Mechanisms

Both the RRIM and the ESPI attempt to ensure the utilities have an incentive to pursue energy efficiency by awarding earnings on an annual basis. The ESPI makes improvements to the RRIM by simplifying the process. For instance, the RRIM determined rewards based on the calculation of the monetized net benefits of the avoided cost of the energy saved. This involved calculating the lifecycle net benefits using the Total Resource Cost (TRC) and Program Administrator Cost (PAC) tests. The ESPI does not require any cost effectiveness calculations, nor does it use the TRC or PAC tests. The ESPI rewards are based on a fixed percentage of expenditures and include additional payments not originally part of the RRIM, including the ex-ante performance review and the fixed payments for codes and standards and non-resource programs. To determine how much of those rewards a utility can earn, the RRIM used an earnings rate of 9% or 12%, depending on the utility meeting a minimum threshold above energy targets. The RRIM also included the potential for no earnings, called the dead band, and the possibility of penalties. The ESPI removes the dead band and the penalty component of the mechanism and the earnings are a known coefficient per energy saved, eliminating the potentially controversial stepwise nature of the incentive. And finally, the ESPI does not require an impact evaluation for every measure, and due to the rolling portfolio framework, impact evaluations have a known due date. The RRIM did not specify which measures to study and did not establish

a due date for the impact evaluations. Table 2 shows the differences between the RRIM and ESPI for major components of the incentive mechanism (CPUC 2007; CPUC 20113).

Table 2 - Comparison of components of California's two shareholder incentive mechanisms

Component of Incentive Mechanism	Risk Reward Incentive Mechanism (2006-2009)	Efficiency Savings and Performance Incentive (2013 - current)
Total Incentive Payments Cap	450 million over three year (\$150 million a year)	\$178 million over two years (\$89 million a year)
Incentives based on	Ex-post evaluation of net lifecycle resource savings that must pass a minimum threshold, with earnings based on avoided cost calculations.	1. EE resource savings (both Ex-Ante and Ex-post) capped at 9% of expenditures; 2. Ex-Ante review performance, capped at 3% of resource expenditures; 3. Incentive to reward savings from codes and standards savings, paid as a straight 12% of C&S expenditures; 4. Incentives for non-resource programs, paid as a straight 3% of non-resource expenditures.
Minimum performance standard	Yes	No
TRC or PAC calculations needed	Yes	No
Earnings calculation	Earnings rate. 9% or 12% of a monetized lifecycle benefits calculation on the avoided costs due to energy savings	Fixed coefficient per unit of savings: \$2525/ GWh; \$6,200 / MW; \$21,331 / Million therm
Penalties	Yes	No
Dead band (neither earnings nor penalties)	Yes	No
Impact evaluations applied to entire portfolio	Yes. Impact studies extrapolated to most of the portfolio	No. Impact evaluations required for custom projects and for deemed measures with ex-ante parameters that are highly uncertain
Impact Evaluation Due Date Established by Decision	No	Yes

Conclusion

After the first two years of implementing the ESPI mechanism, the utilities have been able to claim earnings, based on ex-post evaluation results, by the end of each year. And because of the data transparency there has been little controversy with the ex-post ESPI process. But there are some lessons learned that other states may want to consider before embarking on a similar process:

- **More is Better**

Initially, Commission staff provided a summary spreadsheet of the average ex-post values that were used for ex-post ESPI purposes. This was intended to make the review process easier for stakeholders, but this proved difficult for stakeholders to really understand the underlying changes that were made. In response to stakeholder feedback, Commission staff decided to release the entire dataset, at the measure installation level, without any identifiable customer information. All the databases are publicly posted on the CPUC webpage, including draft versions that have been released. Keeping a publicly posted record of what has been shared with the public may be helpful down the road if any of these decisions are challenged.

- **Early Access to Data**

Stakeholders, who will be using the data, appreciate the opportunity to view the data sooner rather than later. Rather than wait until all the data was perfect, Commission staff decided to experiment with releasing early versions of the database: one without any ex-post results, one with partial ex-post results, and the final dataset with ex-post results. For the early releases, Commission staff may hold public input workshops, webinars or individual discussions with interested parties, with the intent to make sure everyone understands any changes that have been made to the database design. It is also important to make sure parties know if the ex-post data in the ESPI database may change so parties do not spend resources conducting lengthy data analysis on an evolving database. This approach works if the process for reviewing the impact evaluation results are *before* the release of the draft databases. This way any of the results that are in the draft database have already been reviewed and vetted with stakeholders. As a result, any comments on the draft databases are usually confined to actual data errors as opposed to substantive impact evaluation errors (which would have already been resolved by this stage).

- **Replicability**

Each database has 31 pre-built queries that are used for tables found in the impact evaluation studies, the ESPI workbook, and Performance Statement Report. This connects the data source with the final regulatory deliverable and allows any party and staff member to follow a measure from the database, to the aggregated workbooks, and ultimately to the earnings recommended in the Performance Statement Report. In addition, custom queries can be authored, making the ESPI database a powerful source of data and tool for stakeholders to investigate a wide breadth of questions. To also aid in this replication task, it is important to provide both a data dictionary and a “readme” file. The data dictionary provides a general description of each of the 135 column headings in the database. For instance, the field name “EARAdjFlag” may make sense to those who have worked with this dataset before, but would mean nothing to someone new to this process. Equally important is a “readme” file to alert the user to database updates.

- **Phased Review Process**

While having an annual due date for the impact evaluations is good for being able to plan the evaluations and work backwards from the due date, publishing all the draft impact studies within a single month is very taxing for reviewers. In ESPI’s first year, stakeholders were required to provide comments on the impact studies a few weeks after Commission staff held a week of informational public workshops and webinars, often with multiple workshops in one day. Currently, Commission staff staggers the release of the impact studies so the deemed impact studies come out in March and the custom-type studies come out in April. This helps spread out the workload.

- **Plan to Evaluate Effective Useful Life (EUL)²**

The ESPI payments are based on net lifecycle savings; unfortunately, most of California's impact studies focused on net and gross parameters (e.g., unit energy savings, installation rate, net-to-gross ratio). The EUL was the least studied parameter in 2013 and 2014, particularly because EUL studies are expensive and time consuming. Other states should ensure the impact studies fully consider the design of the incentive mechanism and study the parameters that are most critical to the earnings calculation.

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² Effective Useful Life is an estimate of the median number of years that the measures installed under the program are still in place and operable.